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ABSTRACT

Two 3-day symposia, one attended by 131 participants from 33 states and the other by 122 participants from 21 states and two Canadian Provinces, were conducted to report the progress of selected driver training programs and to implement recent research findings. Activities included seminar group discussions, a panel discussion, and major presentations, some of which were: (1) "The Mission, Objectives, Organization, and Programs of the National Highway Safety Bureau" by W. Tarrants, (2) "Driver Education and Training: Evaluation Requirements and Suggested Plans" by W. Lybrand, (3) "The Case for Multiple Standards in Driver Training" by W. Rumsfield, (4) "Modern Learning Principles and Driver Education" by R. Gagne, and (5) "Driver Education and the Commercial Driving School" by R. Brenner. Texts and in some cases an abstract of the presentations, seminar and panel reports, and bibliographic sketches of symposia staff are included. (SB)

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PROCEEDINGS

NATIONAL DRIVER EDUCATION AND TRAINING SYMPOSIA

PUBLIC AND NONPUBLIC SCHOOLS –	COMMERCIAL DRIVING SCHOOLS
December 1 – 4, 1968	January 26 – 29, 1969

Sponsored by
The National Highway Safety Bureau

Conducted by
The Institute for Educational Development

VT 012 979

PREPARED FOR THE U.S. DEPARTMENT OF TRANSPORTATION, NATIONAL HIGHWAY SAFETY BUREAU, UNDER CONTRACTS NO. FH-11-6942 AND FH-11-6947.

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I. OBJECTIVES

II. INTRODUCTION

III. DESIGN OF THE REPORT

I. The Objectives of the Symposia

The symposia were conducted for the purposes of reporting the progress of selected programs in driver education and of contributing to the effective implementation of recent research findings in the field of driver education and training.

The scope of these activities included presentations on "the state of the art" in driver education and related fields, the communication of the plans, policies, and programs of the National Highway Safety Bureau to members of both the public and non-public schools and the commercial driving school communities, and the exchange of information between the National Highway Safety Bureau and the professionals in both communities.

II. Introduction

A. Invitation Network

A primary goal in conducting the symposia was to involve the several kinds of people who are interested in driver education and training. For both activities a total of 1,338 invitations were extended.

Early in August, 1968, a meeting was held in Washington, D.C., to make recommendations for invitees to the first symposium. Included in this meeting were representatives of the National Safety Council, the National Education Association, the American Driver and Traffic Safety Education Association, the National Highway Safety Bureau, and the Institute for Educational Development. Categories nominated for receiving invitations included state board of education members, state superintendents of education, high school principals, school superintendents, state supervisors of driver and traffic-safety education, university personnel in charge of teacher training and/or research in driver education, teachers of driver education in public and non-public schools, and representatives of quasi-public safety organizations, the military services, professional national traffic safety organizations, the research community, traffic court schools, and the press.

A similar meeting was convened in early September, 1968, to make recommendations for invitees to the Commercial Driving School Symposium. This initial meeting included officers of the National Professional Driver Education Association, university personnel responsible for driver education and training, owners of commercial driving schools, and staff members of the Institute for Educational Development. Additional suggestions for invitees were solicited from American Driver and Traffic Safety Education Association and the National Highway Safety Bureau. A list of approximately 2,300 active commercial school owners, compiled in a recent study of commercial schools by Dunlap and Associates, Inc., was used to obtain names of driving school personnel in all fifty states. Representatives of the commercial driving schools in the ten states with the greatest density of schools were also asked to recommend invitees.

As with the first symposium, personnel expressing interest in attending the symposium were obliged. For both symposia a self-addressed, stamped reply postcard was sent with each invitation. A follow-up letter requesting information about attendance was mailed a few weeks after the initial invitation. The invitation letter is provided in the Appendix, and a list of symposia participants in Section XI.

Selected commercial school driving instructors were invited to participate as observers in the public and non-public symposium held in December, and certain driver educators associated with the public and non-public schools were invited to participate in the January symposium.

Individuals representing other agencies or organizations working in driver education or a related field who expressed interest in attending the symposium also received invitations.

B. Symposium Attendance

Thirty-three states were represented at the December symposium and one hundred and thirty-one individuals participated. The January symposium, which was designed for a smaller group, had one hundred and twenty-two participants from twenty-one states and two Canadian Provinces.

C. Design of the Symposia

The symposia were viewed by the Institute staff as an endeavor in adult education. The presentations, seminars, meals, and informal periods were scheduled in such a manner as to provide a variety of settings within the symposia.

The model for these events was designed to maximize "two-way" communication between the presentors and participants. This was accomplished in a number of ways:

1. Both one and five page abstracts of presentations and biographical sketches were provided to the participants prior to the symposia in order to familiarize them with the program content and personnel.

2. Certain participants were given texts of each presentation and requested to develop questions which would follow in a general session after each formal presentation.

3. Seminar groups were organized with the presentors of papers as seminar leaders or resource personnel. Assignment to groups was made to achieve as heterogeneous a seminar group as possible, based upon professional area of work.

All seminar groups were requested to formulate summary comments and recommendations which were then presented to all symposium participants in a general session. These summary reports are included beginning on page 17.

The site selected for the symposia was The Drake-Oakbrook Motel, Oakbrook, Illinois, a quiet setting with few local diversions for the participants. Consequently, "leisure time" during the symposium was generally spent chatting informally with fellow symposium participants, and two way communication was thus facilitated.

III. The Design of This Report

The format of this report is designed so that the reader can first examine the program. Page citations for each document are provided in the program to enable the reader to find rapidly a particular speech or seminar report.

Following two brief overviews (summaries of all events) of both symposia are abstracts of the papers which were presented, with a page designation for the full text of each paper.

The summary reports from the seminars for each symposium are provided in a separate section (page 289, 315), followed by biographical sketches of the seminar leaders and recorders. These reports contain suggestions for programs, policies, and procedures in the field of driver education and training.

The appendix contains a sample of the evaluation form used in obtaining feedback about the symposia, and a copy of the invitation letters.

The key sections of the proceedings can be found on the following pages:

°	Programs for both symposia with page citations of abstracts and page citations for the complete text of each presentation.	page	7
°	Summary statements for both symposia	page	17
°	Abstracts of presentations.	page	35
°	Full text of presentations in alphabetical order by author.	page	43
°	Seminar groupings and seminar reports.		
	December	page	289
	January	page	315
°	January panel discussions.	page	337
°	Biographical sketches of general session chairmen, seminar leaders, and recorders	page	359
°	A list of the participants at both symposia	page	367
°	Appendix	page	381

IV. PROGRAMS FOR EACH SYMPOSIUM

DECEMBER SYMPOSIUM

SUNDAY, DECEMBER 1

1:00- 6:00 **REGISTRATION**

4:30- 6:00 **RECEPTION**

6:00- 8:00 **DINNER**

OPENING REMARKS

A School Administrator Views Driver Training Evaluation

Sidney Marland
INSTITUTE FOR
EDUCATIONAL DEVELOPMENT
TEXT[1] P 179

The Mission, Objectives, Organization, and Programs of the National Highway Safety Bureau

William Tarrants
NATIONAL HIGHWAY
SAFETY BUREAU
TEXT P. 195

The Design of the Symposium

Robert Filep
INSTITUTE FOR
EDUCATIONAL DEVELOPMENT
TEXT P. 4

8:00-10:00 ASSIGNED SEMINARS

What's on my Mind?

SEMINAR LEADERS	SEMINAR RECORDERS
Leon Brody	Joe Casey
Dale Bussis	Jim Berry
Robert Chapman	Robert Nolan
John Conger	James Aaron
Harry Harman	Cissie Gieda
Harold Holmes	Dick Ellis
William Lybrand	Patricia Waller
Frederick McGuire	Robert Goff
Gilbert Teal	Richard Tossell

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[1] *FOR A FULL TEXT OF THE PRESENTATION, TURN TO THE PAGE CITED.*

MONDAY, DECEMBER 2

8:30-12:00 PRESENTATIONS

Evaluation – Telling It As It Is
Reports of the 1967–1968 Research Studies

Evaluation of Driver Education
–Telling It As It Is–

Leon Brody — ABSTRACT[2] P. 37
NEW YORK UNIVERSITY — TEXT P. 80

Driver Education and Training:
Evaluation Requirements and
Suggested Plans

William Lybrand — ABSTRACT P. 39
THE AMERICAN UNIVERSITY — TEXT P. 161

Driver Education and
Training

Gilbert Teal — ABSTRACT P. 41
DUNLAP AND ASSOCIATES, INC. — TEXT P. 236

Plan for Critical Appraisal
of Driver Education
Programs

Robert Chapman
INSTITUTE FOR — ABSTRACT P. 37
EDUCATIONAL DEVELOPMENT — TEXT P. 93

Toward A Comprehensive Plan for
Evaluation of Driver Education and
Training Programs

Harry Harman
NATIONAL ACADEMY OF SCIENCES, — ABSTRACT P. 39
HIGHWAY RESEARCH BOARD — TEXT P. 137

12:00- 2:00 **LUNCHEON**

2:00- 5:00 ASSIGNED SEMINARS

Priorities and Planning

EVENING: INDIVIDUAL SCHEDULING

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[2] *FOR AN ABSTRACT OF THE PRESENTATION, TURN TO THE PAGE CITED.*

TUESDAY, DECEMBER 3

8:30-12:00 PRESENTATIONS

Plans, Programs, and Challenges

Driver Education Today and Tomorrow

Norman Key
NATIONAL EDUCATION ASSOCIATION — ABSTRACT P. 39
TEXT P. 147

Safety Specialist Manpower for Driver Education

Tommy Bertone — ABSTRACT P. 37
BOOZ, ALLEN and HAMILTON, INC. — TEXT P. 69

Research in Driver Education

John Conger — ABSTRACT P. 38
UNIVERSITY OF COLORADO — TEXT P. 107

Modern Learning Principles and Driver Education

Robert Gagné
UNIVERSITY OF CALIFORNIA — ABSTRACT P. 38
BERKELEY — TEXT P. 127

12:00- 2:00 **LUNCHEON**

2:00- 5:00 ASSIGNED SEMINARS

Reality and Rationality

7:00- 9:30 **DINNER**

DISCUSSION

Inconclusive Proofs of Payoff in Driver Education and Other Crash Prevention Measures

Robert Brenner
Deputy Director,
NATIONAL HIGHWAY SAFETY BUREAU — TEXT P. 45

WEDNESDAY, DECEMBER 4

9:00-12:00 ASSIGNED SEMINARS

Quo Vadis

Written Evaluations for Seminars

12:00- 2:00 **LUNCHEON**

SUMMARY SESSION

SEMINAR REPORTS – Seminar Recorders — TEXT P. 289
SUMMARY STATEMENT – William Tarrants — TEXT P. 19

3:00 **ADJOURN**

JANUARY SYMPOSIUM

SUNDAY, JANUARY 26

4:00-11:00 **REGISTRATION**

7:30- 9:30 BRIEFING AND DISCUSSION
Presentors, Seminar Leaders,
and Recorders

MONDAY, JANUARY 27

8:45- 8:50 ***Welcome***

John Kennedy
INSTITUTE FOR
EDUCATIONAL DEVELOPMENT

8:50- 9:30 ***The Mission, Objectives, Organization, and Programs of the National Highway Safety Bureau***

William Tarrants
NATIONAL HIGHWAY
SAFETY BUREAU — TEXT[1] P. 195

9:30- 9:40 ***Protocol and Procedures***

Robert Filep
INSTITUTE FOR
EDUCATIONAL DEVELOPMENT

9:40-11:05 ***Driver Education and Training: Evaluation Requirements and Suggested Plans***

9:40-10:20 William Lybrand
THE AMERICAN UNIVERSITY — ABSTRACT[2] P. 39
TEXT P. 161

10:20-10:30 **COFFEE**

10:30-11:05 ***Driver Education and Training***

Gilbert Teal
DUNLAP & ASSOCIATES, INC. — ABSTRACT P. 41
TEXT P. 236

11:05-11:15 DISCUSSION AND QUESTIONS

11:15-12:30 SEMINARS

(Continue through Lunch)

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[1] *FOR A FULL TEXT OF THE PRESENTATION, TURN TO THE PAGE CITED.*

[2] *FOR AN ABSTRACT OF THE PRESENTATION, TURN TO THE PAGE CITED.*

SEMINAR LEADERS	SEMINAR RECORDERS
William Rhodes	Tom Cheney
John Kerrick	Paul Halula
Marland Strasser	Heinz Naumann
Fletcher Platt	DeWayne Marshman
Warren Rumsfield	U. Hale Gammill
Thad Rarogiewicz	William McCluskey
H.B. Vinson	George Hensel
Paul Hill	John Woods

(Speakers to Serve as Roving Resource Personnel)

12:30-2:00 **LUNCHEON**

The Case for Multiple Standards In Driver Training

Warren Rumsfield
Founding President
NPDEA

ABSTRACT P. 40
TEXT P. 181

2:00-2:40 ***Plan For Critical Appraisal of Driver Education Programs***

Robert Chapman
INSTITUTE FOR EDUCATIONAL DEVELOPMENT

ABSTRACT P. 37
TEXT P. 93

2:40-3:20 ***Plans For Evaluating Driver Training***

Leon Brody
NEW YORK UNIVERSITY

ABSTRACT P. 37
TEXT P. 88

3:20-4:00 ***Toward a Comprehensive Plan for Evaluation of Driver Education and Training Programs***

Harry Harman
NATIONAL ACADEMY OF SCIENCES, HIGHWAY RESEARCH BOARD

ABSTRACT P. 39
TEXT P. 137

4:05-4:15 **COFFEE**

4:15-5:30 SEMINARS

5:30- 8:00 VISIT TO LOCAL COMMERCIAL SCHOOLS

8:00- 8:45 PANEL

State Tests, Rules and Regulations for Commercial Schools and Instructors TEXT P. 352

Richard Dootson
CALIFORNIA

Thad Rarogiewicz
OHIO

John Woods
MASSACHUSETTS

8:45- 9:15 ***A Public-Commercial School Relationship–***

Donald Bruggeman
OHIO TEXT P. 357

TUESDAY, JANUARY 28

8:30- 9:10 ***Research in Driver Education***

John Conger ABSTRACT P. 38
UNIVERSITY OF COLORADO TEXT P. 107

9:10- 9:50 ***Modern Learning Principles and Driver Education***

Robert Gagné
UNIVERSITY OF CALIFORNIA ABSTRACT P. 38
BERKELEY TEXT P. 127

9:50-10:00 **COFFEE**

10:00-10:35 ***The Survey of Commercial Schools***

Gilbert Teal ABSTRACT P. 41
DUNLAP & ASSOCIATES, INC. TEXT P. 246

10:35-12:00 SEMINARS

12:00- 2:00 **LUNCHEON**

Driver Education and the Commercial Driving School

Robert Brenner
Deputy Director,
NATIONAL HIGHWAY
SAFETY BUREAU TEXT P. 56

2:30- 3:10	***Problems of the Commercial Driving Schools*** H.B. Vinson Past-President, NPDEA	ABSTRACT TEXT	P. 41 P. 272
3:15- 3:30	**COFFEE**		
3:30- 5:30	SEMINARS		
7:20- 8:00	***The Highway Systems Research Car*** Fletcher Platt FORD MOTOR COMPANY	TEXT	P. 339
8:00- 8:40	***An Approach to Driver Training*** Harold Smith DRIVER IMPROVEMENT INSTITUTE, INC.	TEXT	P. 344
8:40- 9:20	***Closed Circuit Television in a Mobile Vehicle in Traffic*** Alfred Finch NATIONAL SAFETY COUNCIL	TEXT	P. 347

WEDNESDAY, JANUARY 29

8:45-10:30	SEMINARS Formulation of Final Problem and Solution Statements		
10:30-10:45	**COFFEE**		
10:45- 2:15	GENERAL SESSION Reports from each Seminar (ten minutes each)	TEXT	P. 315
12:15	**LUNCHEON**		
	Summary Statement William Tarrants NATIONAL HIGHWAY SAFETY BUREAU	TEXT	P. 25
2:15	**ADJOURN**		

V. SUMMARY STATEMENTS FOR BOTH SYMPOSIA: AN OVERVIEW

SUMMARY STATEMENT, DECEMBER SYMPOSIUM[1]

William E. Tarrants, Director
Office of Safety Manpower Development
National Highway Safety Institute
National Highway Safety Bureau

In my experience as a Bureau person involved in a lot of contracts, I find that probably my most important role in this exercise is periodically to read the work statement so that we can keep in mind what it is we're trying to do and what it is we've done once we've done it. So, if you'll bear with me for a moment, I'll review the highlights of this work statement so that you can reflect on your experience here these three days to determine yourself whether or not the objectives were, in fact, realized. You may have forgotten it, but I summarized these objectives as the end of my talk last Sunday evening. We'll see now how the proceedings since that time have met the intent of the symposium. Let me quote from the work statement.

> *A major criticism of research in general is that the findings, often obtained at a great cost, frequently are not communicated to the practitioners. The proposed symposium will be an important step in closing this gap in the field of driver education and training. There is a need to report research findings and related information to school administrators and educators at the secondary and higher educational levels. There is also a need for an exchange of information concerning plans and programs in driver education and training*

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[1] *This summary statement is provided to give the reader an overview of the events that took place at the Symposium. It was presented as a review of the activity for the Symposium participants by Dr. Tarrants. He was assisted with its preparation by Dr. Earl D. Heath, of the same agency, who was Contract Manager for the Symposium.*

> *and for a forum in which the major issues of this field can be discussed. The objective of this project is to conduct a national driver education symposium for the purpose of reporting the progress of selected pertinent programs in driver education and, utilizing the experience and cooperation of representative educators and others, contributing to the effective implementation of recent research findings in this field. The scope of this symposium includes presentations on the "state of the art" in driver education and related fields; the communication of plans, policies and programs of the National Highway Safety Bureau to members of the driver education community; and an exchange of information between the NHSB and professionals associated with driver education and training programs in public and private schools."*

Well, I think you can immediately see numerous things that this symposium was intended to do and, hopefully, as you reflect over your experiences here, you will conclude that these objectives have, in fact, been realized. I think it is appropriate at this time to review with you the highlights of some of the presentations. If you recall, Dr. Marland reviewed with us how the school administrator looks at driver education. He talked about the strong feelings for and against driver education, and sampled some of the logic used by its protagonists and its antagonists. He cited the seeming abundance of heat and the scarcity of light on this subject. He concluded his remarks by stating that many of the facts about driver education are thus obscured. This presentation set the tone for the symposium and served to introduce our purpose: the shedding of additional light on the subject and the two-way communication of information.

In my presentation on Sunday evening, I reviewed the organizational structure, mission, and some of the major programs of the National Highway Safety Bureau and its components, along with the mandates given to the Bureau by the legislative enactments of 1966. I then reviewed the major driver education-related research conducted by the Bureau and outlined the objectives of this symposium. Dr. Filep then discussed with us the design of the symposium.

On Monday morning, we heard from the principal investigators of each of the four driver education evaluation studies, and from the principal investigator for the follow-on contract with the National Academy of Sciences. Dr. Brody of New York University acknowledged that the ultimate objective of driver education is to reduce the frequency and severity of highway accidents, but stressed the need for determining the specific forms that driver education should take to enable its objectives to be met with more effectiveness and efficiency. Dr. Brody saw improved teacher preparation as the most critical need in driver education today, and stressed the need to structure the total educational process to fit the development of safe individuals.

Dr. Lybrand of the American University developed the rationale that real-world driving performance must be utilized as the yardstick for driver education and training payoff evaluation. A unique contribution of his study was the beginning of a driving performance analysis conducted within the context of a systems approach to a man-machine task analysis. Dr. Lybrand stressed the use of standardized field performance tests for operational evaluation purposes by the states and a simulator for long-term NHSB pahoff evaluation studies.

Dr. Teal reminded us that accident statistics, as they are presently maintained on a state-by-state basis, are inappropriate for meaningful evaluation research in the area of driver education. He stated that because of the inadequate driver education information base, it was not possible for his group to recommend a long-term evaluation plan. As an immediate short-term evaluation approach, he recommended adaptation of Section D-6 of Evaluation Criteria, developed by the National Study of Secondary School Evaluation. Dunlap and Associates, Inc. as a part of its work, also surveyed the commercial driving school community throughout the United States.

Dr. Chapman, reporting for the Institute for Educational Development, told us of the unique study group approach used by his organization, and of this group's recommendations for evaluating driver education programs. The study group identified three alternative evaluation plans:

> Plan I concerned the quality of the learning experience provided by the driver education program and focused on the program's "openness" and capacity to "grow."
>
> Plan II employed a test of driver proficiency, derived from required real-world behavior by expert opinion, to determine program effectiveness.
>
> Plan III utilized a validated test of driver proficiency to examine a broad range of influences and interventions upon the acquisition and maintenance of driver proficiency over the long term.

The study group recommended that all three plans be implemented concurrently. Dr. Chapman cited two of the overriding objectives of driver education programs; namely: avoidance of accidents and improved traffic flow.

Following the reviews of the evaluation approaches recommended by the four contractors, Mr. Harry Harman of the Educational Testing Service, the principal investigator for the study being conducted by the National Academy of Sciences, explained the plan for synthesizing the results of the four studies and for introducing other recommendations. He suggested that this is an example of the use of applied science to solve a practical problem. The Academy is addressing itself to the task of formulating plans for a nation-wide evaluation of driver education. A variety of disciplines is represented in the group which is chaired by Dr. C. West Churchman of the University of California (Berkeley). The evaluation paradigm developed by the group includes the identification of traffic related tasks and the determination of objectives for driver education programs. He acknowledged that accident reduction is but one measure of driver proficiency. He then outlined the parameters for short-term and long-term evaluation proposals for driver education programs.

Hopefully, during these three days, you've had ample opportunity to discuss the remarks of the principal investigators with them and to clarify or expand on various points of interest. The completed studies, as we mentioned, are now in the Bureau's release process and will soon be available from the Clearinghouse for Federal Scientific and Technical Information (CFSTI), 5285 Port Royal Road, Springfield, Virginia 22151. I am confident that you will find much information in each of the reports that will be interesting and helpful to you.

In the assigned seminars, we attempted to provide a mix of experience and interest. From the reports I have received, and the seminars I have visited, it has been evident that the groups took their assignments very seriously. They worked hard to identify problem areas in evaluation, as they see them, and to formulate alternate plans for approaching these problems.

On Tuesday morning, we moved on to some different problem areas. We heard Dr. Norman Key from the National Education Association review the progress of driver education and some of the problems it faces and how it is meeting these challenges. He identified some positive specific actions which are required if driver education is to advance qualitatively. A striking statistic, and one which all of us will remember I'm sure, is that the average driver education program today has three-tenths of one percent of the high school students' 12,000 hours of instructional time.

Dr. Conger reviewed his and related studies in the field of driver education. He pointed out the fact that, historically, driver education has been justified in terms of its presumed effect on accidents and violations. Now, he said, the better designed and controlled studies have generally failed to find significant evidence for the effectiveness of driver education programs based on these criteria. Dr. Conger called for an investigation of the driving task, with attention to how new approaches to driver education can be developed and tested with attention to training for emergency situations, and with more imagination in the teaching of skills and attitudes.

Dr. Gagne discussed "Modern Learning Principles and Driver Education." He reviewed conclusions about learning derived from other areas which have relevance to driver education. Citing "good driving" as a complex task, he cautioned against assuming that there is some single essence to it. He saw "good driving" not as a matter of proper fundamental skills or as a matter of proper attitude but, rather, as both of these things plus many more. Dr. Gagne stated that if competent driving is a complex matter, it should be possible to reduce this complexity by identifying different types of learning that are involved in the separate kinds of performance required. Designing effective instruction for driving was viewed by Dr. Gagne as first, identifying both terminal and component skills, and second, setting up reasonable conditions under which they can be learned.

Mr. Bertone of Booz, Allen & Hamilton, Inc., reviewed the "Safety Specialist Manpower Study" as it related to driver education. Based on data relating to the sixteen highway safety program standards, accumulated from among the 50 states, 36 job titles were identified, including four pertaining to driver education (Driver Training Program Specialist, Driver Education Supervisor, Driver Education Teacher, and Driver Retraining Instructor). For each job title identified in the study, a job description is presented and estimates of required manpower are provided by year from 1968 through 1977. The study provided information on manpower requirements, manpower resources, and manpower training capacity within the states. The study concludes by suggesting several actions that states may take to assure adequate staffing of highway safety programs, including driver education.

Yesterday we also had the opportunity to listen to the second thoughts of the principal investigators and had the added opportunity to ask questions.

Last evening, we heard a presentation by Dr. Robert Brenner, Deputy Director of the Highway Safety Bureau. After reviewing the mandate given to the Bureau by the Highway Safety Act of 1966, Dr. Brenner, I believe, dispelled any notion that anyone may have had with regard to the Bureau's position on driver education. The Bureau is obviously not opposed to driver education, but it does have a mandate to see that all highway safety program elements, including driver education, contribute to the reduction of death, injury, and property damage on the highway. Dr. Brenner pointed out that driver education is but one of several ways of approaching the problem of reducing highway crashes, and that driver education is but one of several ways of attempting to alter or control driver performance. He suggested that driver education must compete with other traffic accident countermeasures for limited financial resources. He said there can be no "sacred cows" in highway safety. When asked why the Bureau has sponsored research into methods by which driver education program effectiveness can be evaluated when other areas of education are not similarly evaluated, Dr. Brenner reminded the audience that the mission of the Bureau is highway safety and not education per se. We must evaluate the effectiveness of the programs we support in terms which are meaningful to our safety objectives. In answer to the question as to why driver education is not now listed as a high priority item, Dr. Brenner said that the two criteria used in determining the present priority order include (1) evidence of payoff in terms of injury and death reduction and, (2) program elements which will provide a foundation for obtaining such evidence in the future. Dr. Brenner repeatedly reminded us that the Bureau is not opposed to driver education, but that the Bureau is interested in learning how driver education stands competitively when compared to other highway accident countermeasures.

This morning was spent by most of you in reviewing the position papers of the seminar groups, and we've just heard the presentation of these at our general session. I hope I've treated the speakers fairly in my summary comments. We at the Bureau sincerely hope that each of you has profited from this information exchange and that there is now more light on the subject of driver education, particularly as it is viewed by the Bureau. I was pleased to hear Dr. Brenner say last evening that more meetings of this type are needed to expedite information flow and to obtain reactions from practitioners who see and deal with problems daily. I've personally enjoyed this opportunity to speak face-to-face with you and to discuss the various issues that are vitally important to each of you and to the Bureau. Thank you for your truly diligent efforts.

SUMMARY STATEMENT, JANUARY SYMPOSIUM[1]

William E. Tarrants, Director
Office of Safety Manpower Development
National Highway Safety Institute
National Highway Safety Bureau

I would like to review briefly for you some of the highlights of the symposium in which you have participated for the past three days.

The purpose of the symposium was to report the progress of selected pertinent programs in driver education and training, and, utilizing the experience and cooperation of representative commercial driving school administrators and instructors, to contribute to the effective implementation of recent research findings in this field. Whether the National Highway Safety Bureau has succeeded in achieving this objective, perhaps only you can tell us. We hope that the immediate goals of the symposium have been achieved and that perhaps some long-term benefits will be realized as well.

We began on Sunday evening with a briefing for the presentors, the eight seminar leaders, and the recorders.

On Monday morning, Dr. John Kennedy, Vice-President, Institute for Educational Development, welcomed you officially to the symposium and outlined our goals and objectives.

I reviewed for you the history, scope, and mission and described some of the programs of the National Highway Safety Bureau, the sponsor of this symposium.

Dr. Robert Filep, Director of Studies, Institute for Educational Development, and Project Director for this symposium, reviewed the program, procedures, and ground rules for our meeting.

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[1] *This summary statement is provided to give the reader an overview of the events that took place at the Symposium. It was presented as a review of the activity for the Symposium participants by Dr. Tarrants. He was assisted with its preparation by Dr. Earl D. Heath, of the same agency, who was Contract Manager for the Symposium.*

Dr. William Lybrand of the American University was the first of four principal investigators working on the driver education evaluation project to report his findings. He indicated that his group approached the evaluation task from two perspectives. First, his group conducted its study within a "systems analysis" framework. Second, they regarded evaluation of any education and training course to be better served by objective data, that is, data resulting from direct measurement of student behavior rather than by subjective data resulting from judgments of individuals about student behavior. His group presented short, intermediate, and long-range evaluation plans. The short-range plan recommended a survey of driver education and training courses, first, to assess the extent to which learning experiences with high content validity relative to real-world driving performance are being included, and second, to determine the amount of supervised practice which is being given in common and critical driving tasks. As an intermediate-range plan, his group suggested a technique to stimulate use of the vast reservoir of experience in improving driver education and training programs that lies within the instructors who conduct them. He suggested that, if we put evaluation instruments in the hands of teachers or instructors, they can be expected to adjust their programs in innovative and imaginative ways. The long-range plan recommended by the American University focuses on the development of a whole-task simulator. One simulator was recommended for each FHWA region. The simulator would be placed in a mobile van, which could be used as a continual evaluation instrument within each region.

Dr. Gilbert Teal, Vice-President, Dunlap and Associates, Inc., reported on his group's approach. The Dunlap project was accomplished in three phases, consisting of a comprehensive review of the major aspects of driver education, the identification and definition of alternative approaches to the evaluation problem, and the selection of an appropriate, economical, and practical short-term plan within the present and anticipated "state of the art." The recommended evaluation instrument for the short-range program is an approach called Evaluative Criteria, developed by the National Study of Secondary School Evaluation. A long-term evaluation plan was not recommended by Dunlap and Associates, Inc., because of what it termed the inadequate driver education information base in the several states.

During our luncheon on Monday, Mr. Warren Rumsfield, Founding President of the National Professional Driver Education Association, spoke on the growth of the driving school industry and presented the case for "multiple standards" in driver training. He pointed out that, while the driver training school industry itself still has not produced significant scientific research, it has financed driver training research conducted by the National Safety Council. He mentioned some of the misunderstandings which he felt existed between the commercial driving school industry and those involved in driver education programs of public and private secondary schools, and expressed the hope that these misunderstandings can be resolved so that the time and energies involved can be spent on constructive activities.

He underscored the pride of his group in its extensive reforms and improvements made over the past ten years, and acknowledged that much remains to be done. Mr. Rumsfield expressed strong opposition to a "single standard" for driver education which has been advocated by some secondary school practitioners. He also questioned what he termed the "30 and 6 attitude building concept of driver education" and the use of various driver education program adjuncts, such as simulators and driving ranges, as substitutes for actual behind-the-wheel instruction. Mr. Rumsfield quoted extensively from the late Dr. Edward A. Tenney's book The Highway Jungle[1] to reinforce his views on the difference between driver education and driver training. In closing Mr. Rumsfield said that the commercial driving school industry asks only for the opportunity to serve and to prove that it can do an effective job in reducing highway deaths and injuries.

On Monday afternoon, Dr. Robert Chapman, Institute for Educational Development, reported on the third of the four driver education evaluation studies. In approaching its task, the IED convened a Study Group of nine expert consultants representing disciplines relevant to this field. This group met monthly to develop evaluation plans with full realization of the need for a systems approach to improving traffic safety and traffic flow. The Study Group concentrated its attention on one component of the traffic system, the driver, and upon improving his proficiency. The group felt that three distinct issues had to be faced in order to develop an appropriate evaluation plan:

1. What are the driver performance variables that contribute to effective driving in the real world?

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[1] *Edward A. Tenney, The Highway Jungle. New York: Exposition Press, 1962.*

(2) To what extent and how can performance on these variables be influenced?

(3) What interventions for influencing driver proficiency are feasible?

The Study Group identified three alternative evaluation plans worthy of consideration:

Plan I concerned the quality of the learning experience provided by the driver education program and focused on the program's "openness" and capacity to "grow."

Plan II employed a test of driver proficiency, derived from required real-world behavior by expert opinion, to determine program effectiveness.

Plan III utilized a validated test of driver proficiency to examine a broad range of influences and interventions upon the acquisition and maintenance of driver proficiency over the long term.

For purposes of the evaluation program, the Study Group developed tests of driver proficiency that, in its opinion represent considerable improvement over tests that are now available.

The Study Group concluded that its three plans must be implemented concurrently to provide complementary evaluation techniques if driver preparation programs are to be progressively improved on the basis of adequate empirical evidence. The group felt that only in this way can traffic safety be removed from the realm of folklore, and the necessary scientific and technical knowledge be brought to bear on the problem.

Finally, Dr. Leon Brody, Director of Research, The Center for Safety, New York University, reported on the plan for evaluating driver education developed by his group. The research design suggested takes into account the many variables that may influence the effectiveness of driver education. In this design, preference was given to techniques relating to accident reduction. The principal investigator developed an alternate design that accepts driver education and training as axiomatically desirable and then concentrates on comparing different kinds of programs by identifying and measuring student achievement. The alternate design involves a detailed definition of the driving task and immediate post-teaching measurements of student achievement.

In commenting on commercial driving schools, Dr. Brody mentioned that there is little information on a national scale, regarding their organization, supervision, and programs. He speculated that the development of a research design for assessing the quality of commercial school driver training programs might be even more complicated than designs for evaluating high school programs because of the relative lack of information about the many variables involved. He called for attention to the crucial question: "Can the standards recommended for commercial school programs differ from those recommended for high school programs?"

Dr. Brody stated that:

- -- The critical factor in education effectiveness will reside in instructor competence.
- -- Extensive certification requirements for instructors are not necessary.
- -- Certification requirements should include courses in basic and advanced driver education, plus a foundations course in methods of teaching.

Finally, Dr. Brody stated that there simply cannot be one best way of teaching people how to drive. He further questioned why the number of hours should be fixed for all courses, in view of existing individual differences in capacity and background. He also cautioned against interrupting current programs while searching for more effective methods of measuring program effectiveness.

Harry H. Harman of the Educational Testing Service, a subcontractor for the National Academy of Sciences, reviewed the first of the follow-on studies to the four driver education evaluation projects. The Academy of Sciences project is one of a series designed to provide guidance to the National Highway Safety Bureau on the problem of evaluation in this field. The NHSB contracted with the National Academy of Sciences to synthesize the information contained in the four driver education reports and to recommend plans for evaluating driver education programs on a national basis. On the basis of the results of this project and by whatever other means are appropriate, the Bureau plans to validate and then to implement evaluation plans for driver education and training programs. Mr.

Harman reviewed the National Academy of Science's progress toward accomplishing the five tasks within the general objective of this study. By means of this and future research, the Bureau is preparing the groundwork for scientific evaluation of driver education programs and program elements.

On Monday evening, a panel consisting of Richard Dootson of California, Thad Rarogiewicz of Ohio, and John Woods of Massachusetts discussed many of the problems of state licensing tests and state rules and regulations relating to commercial driving schools. An example of how far we have to go became evident when Mr. Woods reported that his state had not yet defined a "commercial driving school" or a "classroom instructor."

Later, Don Bruggeman of Ohio discussed problems arising out of contractual agreements between commercial driving schools and public secondary schools to provide instruction in the practice driving phase. He reported that no contract had yet been cancelled because of unsatisfactory performance on the part of the commercial driving school.

Tuesday morning, we invited people who have worked or are working on projects related to driver education, or training in general, to discuss their findings and observations.

The first of these was Dr. John J. Conger, Vice-President of the University of Colorado, who talked about the "state of the art" of research in driver education. He reviewed for us much of the non-government sponsored research in the field. One of the most important of his observations was that preexisting personality characteristics might serve as a selective factor in driver education, and thus should be controlled in one way or another in studies of driver education program effectiveness. Other significant observations he presented supported the fact that reputable studies indicate that accident and violation rates may be influenced by exposure (miles driver per year under various driving conditions), age, sex, socioeconomic status, education, intelligence, and other variables. Dr. Conger made some suggestions on how these variables could be controlled. He also cautioned us about speaking of the trained driver versus the untrained driver. He stated that these terms are not precisely accurate. Finally, he called for us to avoid clichés and myths, and, worst of all, the bland perpetuation of obvious error. In closing, Dr. Conger stated that we all face a challenge and a responsibility to exercise all the ingenuity we can muster to learn more about the nature of the human-task interaction that is driver education, to develop ways of improving it, and to investigate its effects in a reliable and valid manner.

Dr. Robert Gagné of the University of California at Berkeley discussed "Modern Learning Principles and Driver Education." He reviewed the components of the complex task of driving a motor vehicle effectively and discussed the varieties and the cumulative nature of learning. Effective instruction, according to Dr. Gagne, can be viewed as a matter of 1) identifying both terminal and component skills, and 2) setting up reasonable conditions under which these skills can be learned. The limits of lecturing and simulation for imparting selected knowledge and skill increments were stressed.

Dr. Gilbert Teal, who on Monday had discussed the driver education and training project for which he was principal investigator, reviewed in detail that part of his investigation pertaining to the survey of commercial driving schools. On the basis of this survey he concluded that: some 2,200 commercial driving schools employ a probable 12,000 instructors, maintain an estimated 11,300 driver training cars, and teach somewhere in the neighborhood of one and three-quarters million people each year. Dr. Teal reviewed the types of services provided by these schools; the length of time they have been in business; information on student load, age, and sex distribution; the hours of instruction; and information on training aids and teaching techniques. He also presented information on instructors, classroom topics covered, the range of instruction included in the practice driving phase, methods of program evaluation, and state regulation and control of commercial driving schools. This survey helped fill the void in published material on the subject of commercial driving schools in the United States.

Dr. Robert Brenner, Deputy Director, National Highway Safety Bureau, presented the luncheon address on Tuesday. He identified the work of the commercial driving school industry as part of a unified approach to reducing highway crashes. However, he said that some very tough questions must be asked and answered with regard to how much of our resources can be invested in driver education. Dr. Brenner stated that the modification of driver performance is but one way of reducing highway crashes and that driver education is but one way of modifying driver performance. He said that driver education must compete with other countermeasures for limited available resources. All highway crash countermeasures must pass the test of effectiveness. The mission of the National Highway Safety Bureau is highway safety; not education as such. Thus, the NHSB is not evaluating driver education as an educational enterprise, but as a highway crash countermeasure. The NHSB is interested in buying the most effective countermeasures available, whether they relate to crash prevention (e.g., driver education), or crash survivability (e.g., seat belts).

Dr. Brenner stated that driver education is necessary, but that there are many unsolved questions associated with it, whether it is taught in the public or private secondary school or in the commercial school. It is an area which has been replete with tradition, but which lacks supportive scientific evidence. In establishing priorities, the NHSB gave high priority ratings to those highway safety programs and program elements which have demonstrated their effectiveness and to those which are associated with foundation building activities. Conversely, low priorities were assigned to those program elements which largely had tradition supporting their effectiveness. A ceiling has been imposed on states with regard to the amount which can be spent on driver education. This does not pertain to research in driver education, however. Unhappily, at this time, there is no research that will permit a "yea" or "nay" as to its effectiveness. Dr. Brenner said that it would be interesting to see how graduates of commercial driving school programs shape up when compared to graduates of other programs. But, before this can be done, it will be necessary to agree on objectives and to develop appropriate evaluation instruments. He cited driver licensing as one measure of driver education program effectiveness and also as a contributor to the education process. Finally, Dr. Brenner cited the need for more opportunities for information flow such as has been provided by this symposium.

Following Dr. Brenner's presentation, Mr. H. B. Vinson, Past President, National Professional Driver Education Association, discussed the problems of commercial driving schools. He cited some of the difficulties faced by operators of commercial schools over the years, and identified those problems which have been resolved as well as some of those for which solutions are yet to be found. Mr. Vinson read excerpts from various legislation and other literature citing what he described as unscrupulous practices on the part of some state agencies, along with other excerpts which were presented as examples of practices which are discriminatory against commercial driving schools. The instances cited by Mr. Vinson described such diverse subjects as the sale of used driver training cars as "new" vehicles, and the lack of adequate public liability coverage for students in some public school programs. Mr. Vinson reviewed at length the efforts of the National Professional Driver Education Association during the time which preceded the passage of the highway safety legislation in 1966, and the actions taken by the commercial driving school industry to assure that the commercial schools are not discriminated against.

On Tuesday evening, we heard presentations by Fletcher Platt of the Ford Motor Company, who described the Highway Systems Research Car Study; Harold Smith, of the Driver Improvement Institute, Inc., who discussed selected elements of the driving system which he developed; and Alfred Finch of the National Safety Council, who discussed and demonstrated the use of closed circuit television in a vehicle in traffic and some of its exciting possibilities.

Almost eight hours were made available to the seminar groups, for the purpose of defining and discussing their most critical problems and developing recommendations for resolving these problems. During these sessions, from what I have observed and from what others have told me, there was considerable input from information received from the formal presentations preceding the seminar sessions.

I have been very favorably impressed with the attention you have given to the speakers, with the interest and enthusiasm you have displayed during two and one-half very long days, and with the meaningful questions which you have posed for our speakers. The speakers have expressed to me their appreciation for your responsiveness as an audience.

As I said at the beginning of this summary, only you can tell us whether the objectives of the symposium have been achieved. We hope that they have been. We intend this to be the first in a series of similar symposia with the objective of establishing and maintaining communications among the research community, the National Highway Safety Bureau, the various professional organizations, and the practitioners in the field of public and private secondary and commercial school driver education and training.

Thank you for your many contributions to our program and for coming to our meeting.

Best wishes for continued success in your highway safety effort.

VI. ABSTRACTS OF PRESENTATIONS

SAFETY SPECIALIST MANPOWER FOR DRIVER EDUCATION

Tommy L. Bertone

Between June 1967 and October 1968, Booz, Allen & Hamilton undertook a study for the National Highway Safety Bureau to examine the task of staffing state highway safety programs. This paper reports the work of that study as it applies to driver education.

The study deals primarily with state government employees requiring technical knowledge uniquely relevant to carrying out highway safety programs and for whom specialized, formal training is required. Several job titles normally outside state government employment systems are examined, including those of Driver Education Teacher and Driver Education Supervisor. Personnel of commercial driver education schools are completely excluded.

Empirical data for the study was gathered in field visits to all 50 states. Based upon data accumulated in the states, 36 safety specialist job titles are identified, including 4 pertaining to driver education. For each safety specialist job title identified, a job description is presented and estimates of required manpower are provided by year from 1968 to 1977. Three estimates are provided for each job title. One estimate was obtained directly from state officials during field visits. The other two, a realistic maximum and a realistic minimum estimate, are analytical alternatives developed independently by Booz, Allen & Hamilton staff.

The study estimates manpower resources available to staff highway safety programs and analyses obstacles to adequate staffing. It concludes that, for most highway safety programs, fulfillment of minimum requirements by 1977 seems to be a reasonable expectation. Fulfillment of maximum requirements seems doubtful. However, for driver education, difficulty may even be experienced in filling minimum requirements because of increased entry education specifications.

The study concludes by suggesting several actions that states may take to assure adequate staffing of highway safety programs, including driver education.

EVALUATION OF DRIVER EDUCATION -- TELLING IT AS IT IS

Leon Brody

1. Performance of any task must be learned.
2. Therefore, debating the need for driver education, whatever its nature, is purely academic--a tempest in a teapot.
3. There is, to date, no incontrovertible evidence of a scientific nature that driver education has or has not reduced highway accidents.
4. The problem that does exist is how to accommodate driver education in educational systems, public and private.
5. Another problem is how to improve the structure of such programs, continually, so as to improve the quality and efficiency of learning.
6. Guidelines toward the latter objective are presently derived largely from subjective recommendations of experienced instructional personnel.
7. Because of the complexity of the traffic safety problem as a result of the many variables involved, the potential of experimental or quasi-experimental studies to provide bases for guidelines remains undetermined, and this is likely to be the case for some time to come.

PLAN FOR CRITICAL APPRAISAL OF DRIVER EDUCATION PROGRAMS

Robert L. Chapman

The Institute for Educational Development convened nine expert consultants, representing relevant disciplines, to develop a plan for the National Highway Safety Bureau for evaluating the effectiveness of current or proposed driver education and training programs.

Three issues had to be faced:

- What are driver performance variables that contributed to effective driving in the real world?
- To what extent and how can performance on these variables be influenced?
- What interventions to influence driver proficiency are feasible?

The Study Group identified three alternative evaluation plans worthy of consideration:

Plan I: Evaluating Program Characteristics. This plan concerns the quality of the learning experience provided by the program and focuses on the program's "openness" and capacity to "grow."

Plan II: Evaluating Driver Proficiency. This plan employs a test of driver proficiency, derived from required real-world behavior by expert opinion.

Plan III: Validating Program Effectiveness. This plan utilizes a validated test of driver proficiency to examine a broad range of influences, and interventions, upon the acquisition and maintenance of driver proficiency over the long term.

As the result of comparing the benefits and shortcomings, and the short- and long-term implications of each of the plans, the Study Group concluded that the three plans are not independent approaches to evaluating driver preparation programs but are complementary, iterative phases of an overall, integrated evaluation plan. The Study Group therefore recommended that Plans I, II, and III be implemented concurrently.

RESEARCH IN DRIVER EDUCATION

John J. Conger

Mounting national concern with motor vehicle deaths and disabilities has brought all elements of the highway safety scene under increasingly sharp scrutiny, including the effectiveness of driver education programs. In the past, these programs have been justified to the public largely in terms of studies presumably indicating their effectiveness in markedly reducing accidents and, to a lesser extent, violations. However, many of these studies were lacking in adequate scientific controls for the possible influence on accident and violation rates of factors other than driver education itself. More recent and better controlled studies have generally failed to find significant evidence for the effectiveness of current driver education programs in reducing accidents and violations. Implications of these findings are reviewed.

Questions relating to appropriate goals for driver education programs, methods of improving driver education procedures, and problems of conducting research in this field are discussed also.

CLOSED CIRCUIT TELEVISION IN A MOBILE VEHICLE IN TRAFFIC

Alfred C. Finch

Following the principles of micro-teaching being used effectively at the university level in teacher preparation, a system was designed to use the properties of instant playback to measure driving performance.

The presentation consists of a report of the feasibility study designed by the Motor Transportation and Research Departments of the National Safety Council as conducted by co-investigators Lynn Yeazel and Frazier Damron of the University of Wisconsin under contract to the National Safety Council.

The report includes a discussion of the operating properties and characteristics of closed circuit television using mobile power. It also reports the study design to measure the feasibility of video tape playback.

Conclusions and discussions of possible uses of mobile closed circuit television in driver training and driver improvement follow the conclusions that it is feasible to use CCTV to measure driving performance.

MODERN LEARNING PRINCIPLES AND DRIVER EDUCATION

Robert M. Gagné

Even from a surface viewpoint, being a good automobile driver is evidently a complex affair. It surely must include the following components:

1. Moving the vehicle at near-zero speeds in various directions and into spaces of restricted dimensions.
2. Moving the vehicle at moderate to high speeds in a manner which follows certain external reference "tracks," such as those of road edge, including going around corners and curves.
3. Driving on roads and highways containing other vehicles, people, or objects, in such a manner as to avoid collisions.
4. Executing signals, braking, and other acts whose effect is to aid the progress and safety of other drivers and vehicles.
5. In moderate to high speed driving, responding to unpredictable events by carrying out proper actions and emergency procedures.
6. Carrying out procedures which are legally prescribed, regarding such acts as speed control, stopping at intersections, signalling, parking, and many others.

If good driving is such a complex matter, one surely must avoid, first of all, any assumption that there is some single essence to it. One cannot say realistically, good driving is "really" a matter of proper fundamental skills, or a matter of proper attitudes, nothing more. On the contrary, good driving is all these things. The skills and attitudes relevant to each one of them must be learned. None can be omitted.

Varieties of Learning. One of the ideas from the field of learning research which can usefully be applied to the problem of driving instruction is that there are different varieties of learning, each leading to a different kind of capability, and each requiring a different set of instructional conditions (Gagne, 1965; 1967). If competent driving is a complex matter, then it should be possible to reduce this complexity by identifying the different types of learning that are involved in the separate kinds of performance required.

The Cumulative Nature of Learning. There is still another characteristic of the learning process which may profitably be taken into account in designing instruction for auto driving. This is the cumulative nature of learning effects. By this is meant the fact that learning not only establishes capabilities for carrying out specific performances on the part of the learner, but in each such instance it also provides a residue--a potentiality for positive transfer to further learning.

Instruction. Designing effective instruction for driving can thus be viewed as a matter of first, identifying both terminal and component skills, and second, setting up reasonable conditions under which they can be learned. The right conditions for instruction are going to vary with the nature of what is being learned.

The total aim of driver education and training remains one of having the student learn all of the skills and techniques he needs to be a good driver. Presumably, this means that a suitable variety of instructional conditions must be designed and used.

TOWARD A COMPREHENSIVE PLAN FOR EVALUATION OF DRIVER EDUCATION AND TRAINING PROGRAMS

Harry H. Harman

An interesting approach to devising means of evaluating driver education programs is recounted first. This involves all five papers of this session of the Symposium. Then follows the specific charge of the project, namely, the selection and/or synthesis of previously recommended techniques, or the introduction of new methods, for the development of nationwide validation plans for driver education and training programs.

The work on the project has not yet been completed, so obviously it is not possible to disclose the contents of a report that does not exist. However, our approach and some of our considerations for evaluation of driver education are presented. These cover procedures that can be developed and implemented in the next year or two as well as suggestions for longer range, and necessarily less specific, planning. In the short term, emphasis probably should be placed on careful analysis of the driving task and clearer definitions of the objectives of driver education; the evaluation must, perforce, be based on program content rather than individual driver performance. Any long-term activity should provide research opportunities, including advanced scientific and technical means, that hopefully can lead to meaningful operational evaluation procedures. Several different ways of looking at the long-term plan are considered. The strategy of the total evaluation plan involves an iterative principle whereby inputs from the short-term activity would suggest ideas to be tested, and interim results from the long-term activity would modify and improve earlier operational instruments and procedures.

As a general principle, any proposal for evaluation of driver education and training programs must be sufficiently specific to provide a clear guide as to the course to follow, but general enough to allow sufficient degrees of freedom for the investigator to be able to work effectively, including the exploration of some unforeseen avenues. It should not be implied that the plans under development are unalterable. Quite the contrary; because they are still in a formative state, suggestions or reactions at this Symposium will have influence on our final recommendations.

DRIVER EDUCATION TODAY AND TOMORROW

Norman Key

Following tentative beginnings in safety education from the 1920's through the World War II period, driver education courses have multiplied, with attendant concern for more and better teacher preparation as well as for legislative and financial support. Educators have developed criteria for determining the nature of the components and the procedures comprising driver education courses. They have organized at state and national levels to serve the professional purpose of enhancing the learner's experience in driver education. In addition to industry support for the program, 35 states provide special funding, with Federal sources now beginning to contribute.

Although research findings have been inconclusive in showing specific accident reductions, gains in program effectiveness can be expected to result from better definitions of tasks to be learned as well as from articulating traffic safety instruction in the early years with secondary school driver education courses.

Urgently needed are applications of the outcomes of interdisciplinary endeavors to the learning tasks associated with the context of man, machine, and highway environment. Looking ahead, these endeavors need to focus on teaching about alcohol and traffic safety, about human limitations in light of high-speed highways with built-in inadequacies, and about such physical phenomena as hydroplaning.

Educators will need to move toward the high utilization of media and the better deployment of teaching personnel (including master teachers and paraprofessionals), as well as toward careful experimentation such as with computers in classrooms and possibly also in homes--experimentation aimed at achieving greater instructional effectiveness in the 1970's for the more than 4 million boys and girls who will need the very best preparation we can give them through driver and traffic safety education.

DRIVER EDUCATION AND TRAINING: EVALUATION REQUIREMENTS AND SUGGESTED PLANS

William A. Lybrand

The rationale is developed that real-world driving performance proficiency must be utilized as the source of the "yard-stick" for driver education and training "pay-off" evaluation.

On this basis, three requirements for sound evaluation are derived.

1. A reformulation of driver education and training instructional objectives in terms of driving performance proficiency.
2. Development of new "intermediate" performance proficiency criterion measures which can be used in experimental evaluation studies, as opposed to *ex post facto* accident studies.
3. To validate the intermediate criteria, development of refined and improved "ultimate criterion" measures, reflecting a continuum of driving performance from low to high proficiency, including, but not limited to, improved accident data collection.

On the basis of a driving performance analysis, conducted within the context of a systems approach to man-machine task analysis, a set of instructional objectives are formulated for evaluation studies. These include a general instructional aim limited to preparing the student for *entry* into the motor vehicle transportation sub-system, a terminal instructional objective limited to *real-world* driving performance during the first five years following completion of the course, enabling instructional objectives which emphasize driving proficiency in common and critical driving tasks and situations, the knowledge required to generalize this proficiency to new and different driving situations, and the gaining of personal satisfaction in driving proficiently.

From this frame of reference, the following evaluation plans are suggested.

1. *Long-range Plan*: Development and validation of a whole task, closed-loop, high fidelity *performance proficiency measurement simulator*, with visual and motion cue capabilities, one for each FHA region, to be used in programs of experimental "pay-off" evaluation studies.
2. *Intermediate-range Plan*: Development of standardized low-cost field-performance tests of high content validity, with carefully-constructed rating-scales and instrumented vehicles, for part-task proficiency measurement, for use on closed sections of public roadways, off-street ranges, and even parking lots.
3. *Short-range Plan*: Survey of driver education and training courses for "intrinsic" evaluation of the content validity of learning experiences being offered, and the extent to which practicum driving opportunities are offered.

THE HIGHWAY SYSTEMS RESEARCH CAR STUDY

Fletcher N. Platt

The Highway Systems Research (HSR) Car, developed by Ford's Traffic Safety and Highway Improvement Department, on the outside looks like any other Mercury convertible. But on the inside it has an array of electronic equipment, sensors, counters, and a gold-plated steering wheel that can pick up the driver's stress and pulse.

Sensors are connected to a 20-channel magnetic tape recorder in the trunk of the car. The recorder is porgrammed so the tape can be fed directly into a computer for analysis of important characteristics of the driver in controlling the car and the motions of the car on the road. Thus, both the physiological characteristics and the skill of the driver in various traffic, road and weather conditions are recorded and evaluated.

Since November 1967, the HSR Car has been used for a number of research projects across the country. The first production unit now has been installed into a 1969 model Mercury Marquis convertible by Chesapeake Systems Corporation, the company now manufacturing the equipment.

Among organizations participating in the use of the HSR Car have been: Insurance Company of North America, Pennsylvania Department of Instruction, North Carolina State University, Texas A & M, University of California (UCLA), and Iowa State University.

By invitation from the White House Secret Service, the HSR Car was employed in a special driver evaluation program last January (1968), which included a selected number of Secret Service personnel.

For 1969, Ford plans to carry out certain in-company studies, loan the car for selected research by doctoral candidates, and offer a lease plan for funded projects.

Several states are developing plans to purchase or lease HSR equipment for driver education and driver licensing research. Another state is proposing to evaluate the effects of certain drugs on night vision.

In a recently completed contract for the National Highway Safety Bureau, headed by the Institute for Educational Development, the HSR equipment was recommended for evaluation of driver efficiency and validation of program effectiveness.

THE CASE FOR MULTIPLE STANDARDS FOR DRIVER TRAINING

Warren E. Rumsfield

There are at least two basic philosophies used in driver training. The philosophy employed by the professional driver training schools is physical, practical, and unacademic. Its aim is simply to develop skills and habits which can make it possible to move a vehicle from one point to another without becoming involved in a collision. It does not claim to influence the character, citizenship, or the soul of the student. It renounces the superficial, the trivial, the self-evident, and the irrelevant. In a congested stream of fast flowing traffic, the trained eye and the tutored foot count most heavily. The professional school insists upon allowing for individual differences between students, feeling that some may need only a few hours of behind-the-wheel instruction, others may need 10 times as much.

The philosophy employed by the high schools is spiritual, theoretical, complex, and academic. It assumes that the student knows far less than he actually does. It is the "proper attitude or citizenship philosophy" which says that accidents are caused by bad people being bad, and safety is created by good people being good. Civic virtue, moral conduct, character, and perhaps even mental disorders can be greatly influenced for the better in "30 and 6" hours of driver education with a "properly qualified" teacher.

Recent revelations by researchers as reported in many studies and at the National Driver Education & Training Symposium at Oakbrook, Illinois, on December 1 - 4, 1968, have demonstrated the failure of the philosophy employed by the high schools.

Yet, in spite of the failures of the high schools, their leaders are attempting to impose their philosophies and standards upon the professional driving schools. All this in the name of "a single standard" which is apparently supposed to have some merit because it is "single," even if it lacks other positive qualities. The professional driving schools insist upon critically reviewing the "single standard" to which they are supposed to submit. Certainly if one is expected to buy a package he is entitled to examine the merchandise and to compare it with competing items available.

The case for multiple standards is as simple as this: So long as we have one set of standards which is failing, we'd be rather foolish to put all our eggs in this one basket. The best way to find a system which will produce safe drivers is to explore as many avenues as possible: not just one or two, but possibly several approaches are worthy of study. Who is to deny that perhaps the professional driving schools are on the right track? Certainly not those who are themselves on the wrong track.

It now behooves everyone interested in traffic safety to seek effective ways to create safe and efficient new drivers. Every hand is needed and only the philosophies and approaches which have already been proven erroneous should be rejected. The professional driving schools are eager to serve and cooperate in all efforts. They ask only to be spared from the "single standard" nonsense.

ANOTHER APPROACH TO DRIVER TRAINING

Harold L. Smith

The Smith System can be described as "the ultimate in defensive driving." Yet it is the most positive approach to protecting yourself from the irregular and inconsistent actions of other motorists. Rather than count on indefinite series of reactions to the unanticipated movements of others, the Smith System provides you with a practical working formula to follow, a positive plan for your own driving pattern. When you follow the Smith System, in its spirit and letter, you will discover a new state of mind: alert--yet calm and relaxed for the task of directing your own vehicle.

DRIVER EDUCATION AND TRAINING

Gilbert E. Teal

Dunlap's research project was accomplished in three phases: a comprehensive review of the major aspects of driver education; the identification and definition of alternative approaches to the evaluation problem; and the selection of an appropriate, economical, practical, and manageable short-term plan reasonably within the present and anticipated "state of the art."

The primary conclusions of the study can be summarized as follows. Accident statistics, as they are presently maintained on a state-by-state basis, are inappropriate for meaningful evaluation research in the area of driver education. Little progress has been made in identifying those characteristics which contribute to making a driver education program "good" or whose omission or insufficiency make a program "lacking." It would seem to be inadvisable, from the standpoint of evaluating driver education, to continue the trend toward using more and more sophisticated statistical and system analytical techniques to study accident experience, until the data base is upgraded to a comparable level of sophistication. This step was considered the first step of a "long-range" program effort.

Dunlap's short-range solution to the evaluation problem accepts the status quo; its long-range proposal anticipates a more utopian statistical workplace, with the first step being a major improvement in the statistical data base.

The recommended evaluation instrument for the short-range program is an approach called "Evaluative Criteria" developed by the National Study of Secondary School Evaluation. It has already been field-tested for the past seven years, and is already an accepted part of the evaluation procedures for most secondary school systems throughout the country. It has many advantages, most important of which is its flexibility. In a slightly modified form it can also be used for evaluating programs of commercial schools, violator schools, and adult classes. Modification and refinements can be accomplished easily and with minimal cost. The study outlines a pilot experiment to test the proposed evaluation instrument on a variety of programs.

THE SURVEY OF COMMERCIAL SCHOOLS

Gilbert E. Teal

Dunlap and Associates, Inc., under contract to the U.S. Department of Transportation, recently completed a study directed at developing methods and plans for evaluating the effectiveness of current or proposed driver educational programs. The thrust of this study was based on the establishment of the broadest possible information base on the "state of the art" of driver education and driver education programs.

Despite the obvious fact that a substantial proportion of each year's driver educated population is trained by commercial driver training schools, little concerning the nature or scope of this training was found to be documented. Neither have the roles and contributions of commercial schools been adequately recognized. In order to fill this information void at least partially, a separate study was conducted to:

- Provide information on the services, capabilities, practices, and policies of the commercial driver training school industry.
- Examine existing and proposed state legislation regarding the regulation and supervision of commercial school programs, particularly as it related to quality control.
- Survey the curricula of commercial schools and review evaluation techniques presently employed by states and schools.
- Identify data sources on commercial school programs.
- Develop a data base from which guidelines and recommendations could be generated for consideration and inclusion into the overall evaluation scheme.

The primary data gathering techniques employed in the study were questionnaire surveys and visits Two questionnaire surveys were conducted. The first involved the distribution of a program description questionnaire to 2,800 commercial schools throughout the United States. This survey yielded about a 16 percent return. The second was a survey of state regulations and policies regarding commercial driving schools. Useable data was obtained from 48 states. To supplement the data obtained through these surveys, visitations were made to numerous commercial schools, state departments, and safety research centers by the project staff.

As the result of these information gathering efforts, considerable data were amassed which describe the nature and scope of services presently provided by commercial driving schools. Additionally, the data served as the basis for recommending an evaluation system which is equitable and appropriate for use with all types of driver education programs including commercial schools, secondary schools, adult and violator programs, and other special category schools.

PROBLEMS OF THE COMMERCIAL DRIVING SCHOOLS

H. B. Vinson

1. Problems of the pioneers.
2. Publications creating a bad image of all driving schools.
3. Automobile manufacturers' attitudes toward high school driver education programs.
4. Car dealers' participation in driver education programs.
5. Lack of uniformity in insurance requirements for driver training cars.
6. Traffic Safety Act of 1966.
7. National Safety Council publication of the Congressional intent.
8. The National Highway Safety Bureau's attitude toward the commercial driving school.
9. The single standard concept for all programs.
10. The curse of the "30+6" course of instruction.
11. The driver license concept.
12. The intent of the Traffic Safety Act relating to driver education and training programs.

VII PRESENTATIONS

INCONCLUSIVE PROOFS OF PAYOFF IN DRIVER EDUCATION AND OTHER CRASH PREVENTION MEASURES

Robert Brenner, Deputy Director
National Highway Safety Bureau
Federal Highway Administration
U.S. Department of Transportation

An engineer with his undergraduate degree in mechanical engineering from the University of Pennsylvania and a doctorate in engineering from the University of California, Dr. Brenner is an authority on engineering and statistical research as applied to traffic safety and accident prevention. His corollated field of interest and experience is in urban transportation research and land use planning with emphasis on the interrelationships between transportation planning and social goals of a community.

Before assuming his present position, Dr. Brenner served as Special Assistant for Traffic Safety Research to the Under Secretary for Transportation, Department of Commerce.

Prior to joining the staff of the Under Secretary, he was the senior research engineer and statistician on the staff of the Institute of Transportation and Traffic Engineering of the University of California at Los Angeles. During his eighteen years on this assignment he was responsible for a wide variety of research and educational projects related to traffic safety. In addition, he participated in planning and implementing parts of the State of California's continuing five-year research program in traffic safety.

He has served as consultant to a number of private industrial groups, and on various committees of the Highway Research Board. His government assignments have included memberships on the Secretary's (HEW) Advisory Committee on Traffic Safety, and Accident Prevention Panel, National Institute of Health.

He is a registered professional engineer, a member of a number of professional and honorary societies, and the author of many reports and scientific publications related to the technology of accident research, engineering, statistical analysis of accident data, urban transportation, and land use planning.

The Highway Safety Act of 1966 requires each state to have a highway safety program designed "... to reduce traffic accidents and deaths, injuries, and property damage resulting therefrom ...." It is for this reason that the National Highway Safety Bureau was established. Its mandate is to assist the states to achieve the goal of fewer traffic deaths and injuries.

The act further provides that to be approved by the Secretary of Transportation, a state highway safety program must include comprehensive driver training: it is the only substantive action program so specifically identified. Clearly, the Highway Safety Act envisions driver education and training as a most important countermeasure to the rising toll of highway crashes.

However, modification of driver performance is but one of several ways of approaching the problem of reducing highway crashes. And driver education is but one of several ways of attempting to alter or control driver performance. The mandate of the Bureau is not to promote driver education per se, but to promote safety through driver education and by any other measures that will produce the ultimate goal of lives saved and injuries prevented.

Driver education must, therefore, compete with other traffic accident countermeasure programs for limited financial resources. There can be and are no sacred cows in highway safety. Resources cannot be allocated to activities that aren't paying off, for there simply aren't enough funds for those that are producing results, or have this promise. All activities must, sooner or later, pass the test of effectiveness. And this test must be in the context of highway safety primarily, with corollary social benefits being of secondary importance from the standpoint of safety resource allocations.

The mission of the National Highway Safety Bureau is highway safety, not education as such. Accordingly, it is the efficacy of driver education as a highway death and injury countermeasure, not its role in producing better citizens in the broad meaning of this term, that will largely determine how much of the safety dollar it will and should receive.

In a most pragmatic vein, we must buy the greatest savings in lives with the dollars earmarked for this specific social goal. And we must do so wherever and however we can -- whether by preventing the occurrence of crashes or by increasing survival from the crashes that do occur.

Driver education is a crash-prevention activity; the use of seat belts, on the other hand, is a crash-survivability measure. The payoff of seat belts, occupant restraints, and other vehicle design improvements that increase survival in crashes has been established beyond a shadow of a doubt. The payoff of driver education is under challenge.

But it is not the only crash-prevention activity whose payoff is under challenge. For example, motor vehicle inspection is also in question, as is the role of the traffic courts, in the ultimate analysis of lives saved as a result of these and other programs that traditionally have been part of highway safety.

Evidence of substantial payoff in any crash-prevention activity is extremely difficult to obtain. Unfortunately, the failure to obtain such evidence, which I believe is intrinsic in the nature of accident causation statistics, can readily lead to such absurd misinterpretations as " . . . there is no point in inspecting brakes to assure proper working order because no one has ever established a statistically significant correlation between bad brakes and accidents . . . ."

Driver education is necessary, and we no more need address the question "Do we need driver education?" than the question "Do cars need brakes?"

But there are many questions yet to be answered on how best to teach the driving task to teenagers in public schools or to adults in professional driver training schools.

Similarly, there are as yet many unanswered questions on brakes: drum vs. disc, diagonal vs. conventional, 2-wheel or 4-wheel anti-locking systems. Even more difficult, braking issues have not been resolved on the used motor vehicle. Brakes must deteriorate with time and use, and abuse. How much deterioration should be permitted before the society, through the appropriate motor vehicle inspection standard, mandates that corrective repairs must be completed before the vehicle is permitted to operate again on public thoroughfares.

And since good driver performance and good vehicle brakes are only two of many traffic accident countermeasures, how much should the society invest in them in comparison with the investments in other countermeasures? If $10 or more is spent each year on training each of 10 million new drivers, somebody is picking up a $100 million tab. If motor vehicle inspection generates $10 extra in brake work each year for each vehicle in use on public thoroughfares, the total for the 100 million vehicles in use is $1 billion.

This kind of arithmetic is easy to perform, once the dollar values of the unit measures are established. It is much harder, of course, to determine what these dollar values should be. But the most difficult task by far is to establish the return produced by these unit expenditures and their aggregate in the context of setting national investment policy.

In this hyper-simplified exercise, I state that " . . . somebody must pick up the tab of highway safety . . . ." I make the statement to emphasize what possibly has been overlooked, or at least has received very little mention in the context of the new Federal emphasis on the problem. This is the vast multiplier effect that the comparatively modest authorizations for Federal funding under the two long overdue safety laws have upon other sectors of the society; on public agencies, industry, and the all-important individual citizen -- both from the standpoint of his pocketbook and his chances to live on highways and to let others live to see their safe arrival at their destination.

Let me use the case of tire wear to illustrate this multiplier principle. The Department last year issued a tire safety standard that requires, among its several provisions, that when the tire has worn to where its depth of tread is 1/16" a different color band will appear to serve as a readily recognized indication of the need for replacing or retreading the tire. If the value had been set at 1/8", the additional average operating cost might have increased by $10 per car per year, with various assumptions as to mileage associated with tread wear, cost of tires, and annual miles driven.

The maximum level of tire wear prescribed by any Federal, state, or local regulation translates into operations costs to the motorist as inexorably as poor gas mileage due to fouled sparkplugs or a badly tuned engine.

And similarly, a Federal standard that calls for doubling the hours of behind-the-wheel instruction accordingly changes the investment in driver education -- whoever pays the bill.

Thus, every rulemaking action, whether directed toward the vehicle, or the highway, or the driver, must be examined in the context of the level of investment that will be required to implement it. For clearly, it is virtually idle to issue a rule or standard which generates costs that cannot be met with available Federal, state, local, or private sector funds.

With the enactment of the two vehicle and highway safety laws in September 1966, sustained and significant Federal support became available for the first time. As I stated earlier, this was long overdue.

But the available funds are far below needs in every aspect of the all-out effort and multifaceted provisions of the two laws. Consider only the Highway Safety Act with its provision for strong driver education programs being of most immediate relevance to this symposium. Roughly, about $60 million of Federal support is available in this fiscal year for grants to states in all highway safety programs, including driver education. The states have estimated their needs at approximately $600 million. This means that $1 is available for about every $10 of need.

The states further estimate that by 1976 the deficiency will be in excess of $2.5 billion annually. Although the Congress has given every indication of increased support, and we anticipate an increase, it is nonetheless clear that available funds will always be far below needs.

This adds up to one word -- priorities. Priorities in resource allocations among the various activities that comprise a highway safety program.

We all have recognized the need to assign priorities, but most important, this is also the specific directive of the Congress. Specifically, the Conference Committee on Appropriations of the Second Session, 90th Congress, included the following directive in its Report No. 1833 on appropriations of Department of Transportation funds for fiscal year 1969:

> *"The committee of conference directs that the funds provided be obligated only on the most essential and practical program activities in the belief that concentration of funding on fewer programs than are proposed in the budget will result in more clearly demonstrable accomplishments."*

A directive of this nature is unmistakably clear. In effect, it calls for learning how the entire field of improving driver performance, by whatever means, shapes up as a family of countermeasures, when compared to improvements in vehicle and highway design, for example; how driver education shapes up when compared to other ways of improving driver performance. It forces answers now on how much attention is to be given to the driver, to the vehicle, and to the roadway; on how the resources are to be allocated among the several highway safety program elements.

In accordance with this directive, we developed a schedule of priorities for providing Federal grant-in-aid support to states for highway safety activities. The priorities are designed to place balanced emphasis between program areas anticipated to produce relatively near-term payoff and those of a longer-range nature which, however, call for the development and operation of needed basic data and information generation systems. High priorities are assigned to the immediate payoff or foundation building program areas; low priorities are assigned to the others.

Scientific evidence, not tradition, should direct the pattern of these priority assignments as directed by the Congress for the public investment in highway safety -- particularly in light of the vast multiplier effects produced thereby.

Unfortunately, the highway safety field, which is replete with tradition, is concomitantly lacking in scientific evidence of payoff.

We accordingly chose to assign high priorities to those program elements that had promise of demonstrable near-term payoffs or at least would lay the groundwork or foundation for obtaining such evidence in the near future. We assigned low priority to those program elements that had tradition going for them, but little more, in the way of conclusive evidence or promise of producing conclusive evidence of payoff.

Driver education was assigned to the low priority group. There were two basic reasons:

1. Evidence of payoff is as yet inconclusive for driver education programs.

2. Operational programs as conducted by states and local units do not generally provide for rigorous self-evaluations one year, two years, or twenty years hence.

The effect of these priority assignments is not to cut off driver education support. In fact, in terms of absolute dollar amounts, we anticipate that more support will be available than ever before because the overall highway safety appropriations are increasing.

What has been done is to impose a ceiling on the percentage of the Federal safety dollar that can be used by states on driver education.

Furthermore, it must also be borne in mind that this restriction pertains to the level of investment in operational driver education programs -- production of trained drivers, as it were. It does not pertain to research in driver education. Moreover, we feel that the need for greatly expanded research in driver education has never been greater. This position is exemplified by the sponsorship by the Department of Transportation of this symposium, and by our call for extensive longitudinal research in driver education, in the belief that conclusive evidence will not be obtained in some magical overnight breakthrough.

In effect, the very pragmatic position of the government is to keep the level of the Federal support in operational driver education programs under reasonable control while going all-out with research to obtain better scientific evidence than heretofore has been available on the overall payoff in driver education or the differential payoff among alternative driver education techniques.

Let us not kid ourselves; conclusive scientific evidence is not widely prevalent on either of these types of questions. We have repeatedly asked experts to advise on what the allocation of resources should be between behind-the-wheel and classroom instruction. We have received opinions and, of course, have taken them into account as the best subjective judgments of our experts. But even the experts do not agree among themselves, and none offers conclusive scientific evidence in support of his position.

We can complicate matters further. Instead of limiting the inquiry to the simple issue of behind-the-wheel versus classoom dollar investments, consider some of the startling new developments that have begun to revolutionize the art of modern teaching -- television, electronic teaching laboratories, self-instructional devices, instructional packages of various types, computers, data and data transmission systems, new library technologies.

What are the criteria for allocating resources among these devices? Should we put money into them in contrast to providing better training to the teachers? Possibly the better investment is to upgrade behind-the-wheel training to include training students in the handling of vehicles in skids and other situations of impending loss of control.

And there is the additional intriguing idea that possibly we should begin to place more emphasis on affecting driver performance by new approaches to driver licensing -- using this as an instructional rather than a selection mechanism.

Until the data are available to back up the answers to questions such as these, driver education and other highway safety efforts will continue to struggle for support.

Driver education cannot be described as an activity that has failed to produce payoff in fewer deaths and injuries. If there has been a failure, it is in there not having been mounted as yet a research effort capable of yielding conclusive answers -- yea or nay -- on the overall effectiveness of driver education, or on the comparative effectiveness of alternative driver education techniques.

This field has suffered the blight of the inconclusive experiment -- the one that is planned, carried out, has its data interpreted, and then is reported in the literature although some reflection at the start would have indicated that the work as planned couldn't possibly be capable of producing demonstrable differences. And the repeated failures of the program to produce such demonstrations are, in turn, interpreted as failures to produce results. The scientist properly reports that the data obtained did not permit him to reject some null hypothesis on the effectiveness of driver education; the layman, and sometimes even fellow scientists, immediately reach the unwarranted conclusion that driver education is ineffective.

Possibly the driver education programs under test were in fact ineffective. On the other hand, they possibly might have been effective, but the inconclusive investigation was incapable of detecting this effectiveness. The reasons for this possible lack of sensitivity of the investigation to the phenomena under study could lie in any of the multiplicity of factors that are well-known contributors to error variance in any kind of educational research. And the problem is compounded further when the criteria of effectiveness are Poisson-distributed accident data.

For years, the highway safety field has limped along with almost trivial research support. Many of us in this field have, both in public and private, in print and on the podium, decried the fact that the field was replete with the self-fulfilling pronouncements of its experts. In fact, my earlier statement in this talk is very much in this vein; repeating it here:

> *". . . unfortunately, the highway safety field which is replete with tradition is concomitantly lacking in scientific evidence of payoff . . . ."*

And there have been many other statements to this same effect: "armchair philosophy," "conventional wisdom," "absence of scientific rigor," and so on.

It would be one of the supreme ironies of the day if the pursuit of scientific evidence of highway safety program effectiveness led to the dismemberment of organized highway safety programs. Figuratively speaking, to throw the baby out with the bath.

Let me point out that this would not be the first time that inconclusive or inadequate scientific evidence, properly interpreted by the responsible scientist but imprecisely reported, produced more harm than good.

But if good research that fails to produce conclusive results in support of driver education is a problem, then atrocious research that purports to support driver education is a far nastier problem. Let me make my position clear, therefore, that we should and must continue to seek better scientific evidence of program payoffs, that armchair wisdom won't go far in the assignment of priorities and resources to driver education.

However, we cannot overlook the danger inherent in the misinterpretations of the scientifically sound yet inconclusive investigations of driver education.

Instead, we must recognize with complete candor that in driver education research we are, figuratively speaking, swimming upstream -- possibly far more than in other areas of research on how to affect human behavior. Enormous sample sizes are needed to test effectively even almost self-evident hypotheses when the criteria center on accident involvement. Matters don't improve very much with the substitution of so-called proxy measures such as moving violation histories of the test subjects.

In one investigation that I recall, statistically significant correlations between static visual acuity and accident involvement did not begin to appear until the sample was in excess of 15,000 drivers selected randomly from the general population.

I hardly need take the time here to recite the many factors that are contributing to error variance in driver education research:

- the statistical rarity of the accident event, necessitating long periods of observation awaiting sufficient numbers of criterion events to occur
- the probably erroneous assumption of a static relevant distribution during the course of this waiting period
- personal differences among test subjects
- the almost impossible task of rigorous estimation of exposure to risk

And so on.

These are only some of the reasons why I call for caution and for realistic appraisals of what can or should be promised in the way of outputs -- at least short-term outputs of driver education research.

Inconclusive results are the expected; conclusive results the unexpected.

But the dangers of misinterpretations of the inconclusive findings cannot be, in my mind, overemphasized.

And this danger is not limited to driver education, driver licensing,and other activities aimed at influencing driver performance. Consider some of the safety issues in vehicle braking performance and tire wear. To the best of my knowledge, no one as yet has produced statistically significant correlations between bad brakes and accident likelihood.

To cite another example, an author in a recent publication reported no correlation between the condition of the tires and accident involvement.

Visual acuity, driver education, braking performance, tire wear; all with low or no statistically significant correlations with accident involvement! Despite such data one would hardly proceed to drive on a freeway with a vehicle whose brakes had totally failed, or to drive on a rough mountain road in a vehicle whose tires were worn bald. Nor would one advocate permitting a blind person to drive, or a youngster who had never been behind the wheel of a vehicle to venture without any training whatsoever onto a freeway alone.

All of these are absurd possibilities stemming from the extension to the limit of conclusive statistical findings of "no evidence of effect."

Absurdities in the limit, yes. But I do not know when the operational decision stemming from the accident research that yields the low correlations changes from scientific to absurd, if not to the scientist then at least to the lay public.

Inconclusive results in safety research are the expected; conclusive results or proof of program effectiveness is the unexpected or the rare event. We all share the wish that this weren't so.

But it is so, and will continue to be so until the nation makes the decision to attack the problem on a research scale commensurate with its complexity.

In the meantime, I am afraid that many will continue to have a field day with the inconclusive results -- quoting them piously or attacking them with spirit, as the occasion warrants. And not necessarily in a consistent manner, unless the consistency is limited to self-interest, enlightened or otherwise.

As I stated earlier, if for no other reason than that our resources don't permit it, there can be no sacred cows in highway safety. No silver bullets, magical nostrums, or panaceas.

I do not know, for example, but that we should begin to reexamine even organizational sacred cows that carefully compartment driver education, driver licensing, and the traffic courts system that has to deal with the failures of the first two.

I believe in driver education. But at this point in time I believe at least as much in driver education research, for driver education is in competition in the fullest sense of the word for the very limited safety dollar.

Payoff evidence, not emotional appeals or heuristic arm waving, will be required for driver education to hold a place in the all-important allocation of resources among competing countermeasure alternatives for reducing traffic deaths and injuries. And I am not so sure that it will win with emotional arm waving. Even if I restrict my alternatives to the safety investment by the typical school district, I must ask for the criteria for investing in the upgrading of driver education in contrast to, say, investing in improved maintenance of school bus brakes.

It would be interesting to poll this audience on this simple question -- more money on school bus maintenance or more money on driver education, but not both because the money for both simply is not there.

It would also have been interesting to have polled the citizens around Huntsville, Alabama, on this same question last April when a school bus there lost its brakes, went out of control, and four or five children were killed, others seriously injured.

It might even be more interesting to poll those same people near Huntsville on the same question today. For another school bus there lost its brakes about two weeks ago, and more children were killed.

No, I am not sure that driver education will do well on emotion alone.

These are brutally tough investment questions that have to be attacked with all of the research skills we can command. They are not going to go away by themselves.

And if the advocates or opponents of one safety countermeasure or another choose to ignore such questions, I do not believe that the public or the government at Federal, state, or local levels will. At least, not for very long.

DRIVER EDUCATION AND THE COMMERCIAL DRIVING SCHOOL

Robert Brenner[1]
Deputy Director
National Highway Safety Bureau
Federal Highway Administration
U.S. Department of Transportation

PREFACE

This is the second of the National Driver Education and Training Symposia conducted by the Institute for Educational Development under a contract with the National Highway Safety Bureau. In the first symposium I had the privilege of addressing driver education specialists in the public and non-public secondary school community. Today, I am equally privileged to talk to you in the commercial driving school community.

It is appropriate here to repeat some of my earlier remarks to the first symposium, and to add some additional perspectives that relate directly to the commercial driving school community.

But the theme is the same as in my earlier presentation, specifically, that very tough questions have to be attacked relating to how much of our resources should be invested in driver education -- regardless of whether it is accomplished in public school systems or in commercial driver training schools. Driver education must be able to compete for limited resources with other aspects of a comprehensive highway safety program, such as motor vehicle inspection. Factual evidence is mandatory, for emotional arm-waving alone alone will not justify the case for investing in driver education or any other activity purported to be an effective countermeasure to highway deaths and injuries.

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[1] *For biographical sketch, see p. 45.*

INTRODUCTION

The Highway Safety Act of 1966 requires each state to have a highway safety program designed ". . . to reduce traffic accidents and deaths, injuries, and property damage resulting therefrom . . . ." The National Highway Safety Bureau was accordingly established with the mandate to assist the states to achieve the goal of fewer traffic deaths and injuries.

The act further provides that to be approved by the Secretary of Transportation, a state highway safety program must include comprehensive driver training: it is the only substantive action program so specifically identified. Clearly, the Highway Safety Act envisions driver education and training as a most important countermeasure to the rising toll of highway crashes.

However, modification of driver performance is but one of several ways of approaching the problem of reducing highway crashes. And driver education is but one of several ways of attempting to alter or control driver performance. The mandate of the Bureau is not to promote driver education per se, but to promote safety through driver education and by any other measures that will produce the ultimate goal of lives saved and injuries prevented.

Driver education must, therefore, compete with other traffic accident countermeasure programs for limited financial resources. There can be and are no sacred cows in highway safety. Resources cannot be allocated to activities that aren't paying off, for there simply aren't enough funds for those that are producing results, or have this promise. All activities must, sooner or later, pass the test of effectiveness. And this test must be in the context of highway safety primarily, with corollary social benefits being of secondary importance from the standpoint of safety resource allocations.

The mission of the National Highway Safety Bureau is highway safety, not education as such. Accordingly, it is the efficacy of driver education as a highway death and injury countermeasure, not its role in producing better citizens in the broad meaning of this term, that will largely determine how much of the safety dollar it will and should receive.

In a most pragmatic vein, we must buy the greatest savings in lives with the dollars earmarked for this specific social goal. And we must do so wherever and however we can -- whether by preventing the occurrence of crashes or by increasing survival from the crashes that do occur.

Driver education and training is a crash-prevention activity; the use of seat belts, on the other hand, is a crash survivability measure. The payoff of seat belts, occupant restraints, and other vehicle design improvements that increase survival in crashes has been established beyond a shadow of doubt. The payoff of driver education is under challenge. And I might add that the challenge cuts across the board to driver education in public and non-public secondary schools as well as commercial driver training schools.

But it is not the only crash-prevention activity whose payoff is under challenge. For example, motor vehicle inspection is also in question, as is the role of the traffic courts, in the ultimate analysis of lives saved as a result of these and other programs that traditionally have been part of highway safety.

Evidence of substantial payoff in any crash-prevention activity is extremely difficult to obtain. Unfortunately, the failure to obtain such evidence, which I believe is intrinsic in the nature of accident causation statistics, can readily lead to such absurd misinterpretations as ". . . there is no point in inspecting brakes to assure proper working order because no one has ever established statistically significant correlation between bad brakes and accidents . . . ."

PROGRAM PAYOFF

Driver education is necessary, and we no more need address the question "Do we need driver education?" than the question "Do cars need brakes?"

But there are many questions yet to be answered on how best to teach the driving task to teenagers in public schools or to adults in commercial driver training schools.

Similarly, there are as yet many unanswered questions on brakes: drum vs. disc, diagonal vs. conventional, 2-wheel or 4-wheel anti-locking systems. Even more difficult, braking issues have not been resolved on the used motor vehicle. Brakes must deteriorate with time and use, and abuse. How much deterioration should be permitted before the society, through the appropriate motor vehicle inspection standard, mandates that corrective repairs must be completed before the vehicle is permitted to operate again on public thoroughfares.

And since good driver performance and good vehicle brakes are only two of many traffic accident countermeasures, how much should the society invest in them in comparison with the investments in other countermeasures? If $10 or more is spent each year on training each of 10 million new drivers, somebody is picking up a $100 million tab. If motor vehicle inspection generates $10 extra in brake work each year for each vehicle in use on public thoroughfares, the total for the 100 million vehicles in use is $1 billion.

This kind of arithmetic is easy to perform, once the dollar values of the unit measures are established. It is much harder, of course, to determine what these dollar values should be. But the most difficult task by far is to establish the return produced by these unit expenditures and their aggregate in the context of setting national investment policy.

In this hyper-simplified exercise, I state that ". . . somebody must pick up the tab of highway safety . . . ." I make the statement to emphasize what possibly has been overlooked, or at least has received very little mention in the context of the new Federal emphasis on the problem. This is the vast multiplier effect that the comparatively modest authorizations for Federal funding under the two long overdue safety laws have upon other sectors of the society; on public agencies, industry, and the all-important individual citizen -- both from the standpoint of his pocketbook and his chances to live on highways and to let others live to see their safe arrival at their destination.

Let me use the case of tire wear to illustrate this multiplier principle. The Department last year issued a tire safety standard that requires, among its several provisions, that when the tire has worn to where its depth of tread is 1/16" a different color band will appear to serve as a readily recognized indication of the need for replacing or retreading the tire. If the value had been set at 1/8", the additional average operating cost might have increased by $10 per car per year, with various assumptions as to mileage associated with tread wear, cost of tires, and annual miles driven.

The maximum level of tire wear prescribed by any Federal, state, or local regulation translates into operations costs to the motorist as inexorably as poor gas mileage due to fouled sparkplugs or a badly tuned engine.

And similarly, a Federal standard that calls for doubling the hours of behind-the-wheel instruction accordingly changes the investment in driver education -- whoever pays the bill.

Thus, every rulemaking action, whether directed toward the vehicle, or the highway, or the driver, must be examined in the context of the level of investment that will be required to implement it. For clearly, it is virtually idle to issue a rule or standard which generates costs that cannot be met with available Federal, state, local or private sector funds.

PRIORITIES

With the enactment of the two vehicle and highway safety laws in September 1966, sustained and significant Federal support became available for the first time. As I stated earlier, this was long overdue.

But the available funds are far below needs in every aspect of the all-out effort and multifaceted provisions of the two laws. Consider only the Highway Safety Act with its provision for strong driver education programs being of most immediate relevance to this symposium. Roughly, about $60 million of Federal support is available in this fiscal year for grants to states in all highway safety programs including driver education. The states have estimated their needs at approximately $600 million. This means that $1 is available for about every $10 of need.

The states further estimate that by 1976, the deficiency will be in excess of $2.5 billion annually. Although the Congress has given every indication of increased support, and we anticipate an increase, it is nonetheless clear that available funds will always be far below needs.

This adds up to one word -- priorities. Priorities in resource allocations among the various activities that comprise a highway safety program.

We all have recognized the need to assign priorities, but most important, this is also the specific directive of the Congress. Specifically, the Conference Committee on Appropriations of the Second Session, 90th Congress, included the following directive in its Report No. 1833 on appropriations of Department of Transportation funds for fiscal year 1969:

> *"The committee of conference directs that the funds provided be obligated only on the most essential and*

> *practical program activities in the belief that concentration of funding on fewer programs than are proposed in the budget will result in more clearly demonstrable accomplishments."*

A directive of this nature is unmistakably clear. In effect, it calls for learning how the entire field of improving driver performance, by whatever means, shapes up as a family of countermeasures, when compared to improvements in vehicle and highway design, for example; how driver education shapes up when compared to other ways of improving driver performance. It forces answers now on how much attention is to be given to the driver, to the vehicle, and to the roadway; on how the resources are to be allocated among the several highway safety program elements.

In accordance with this directive, we developed a schedule of priorities for providing Federal grant-in-aid support to states for highway safety activities. The priorities are designed to place balanced emphasis between program areas anticipated to produce relatively near-term payoff and those of a longer range nature, which, however, call for the development and operation of needed basic data and information generation systems. High priorities are assigned to the immediate payoff or foundation building program areas, low priorities are assigned to the others.

Scientific evidence, not tradition, should direct the pattern of these priority assignments as directed by the Congress for the public investment in highway safety -- particularly in light of the vast multiplier effects produced thereby.

Unfortunately, the highway safety field, which is replete with tradition, is concomitantly lacking in scientific evidence of payoff.

We accordingly chose to assign high priorities to those program elements that had promise of demonstrable near-term payoffs or at least would lay the groundwork or foundation for obtaining such evidence in the near future. We assigned low priority to those program elements that had tradition going for them but little more in the way of conclusive evidence or promise of producing conclusive evidence of payoff.

Driver education was assigned to the lower priority group. There were two basic reasons:

1. Evidence of payoff is as yet inconclusive for driver education programs.

2. Operational programs as conducted by states and local units do not generally provide for rigorous self-evaluations one year, two years, or twenty years hence.

The effect of these priority assignments is not to cut off driver education support. In fact, in terms of absolute dollar amounts, we anticipate that more support will be available than ever before because the overall highway safety appropriations are increasing.

What has been done is to impose a ceiling on the percentage of the Federal safety dollar that can be used by states on driver education.

Furthermore, it must also be borne in mind that this restriction pertains to the level of investment in operational driver education programs -- production of trained drivers as it were. It does not pertain to research in driver education. Moreover, we feel that the need for greatly expanded research in driver education has never been greater. This position is exemplified by the sponsorship by the Department of Transportation of this symposium, and by our call for extensive longitudinal research in driver education, in the belief that conclusive evidence will not be obtained in some magical overnight breakthrough.

In effect, the very practical position of the government is to keep the level of the Federal support in operational driver education programs under reasonable control while going all-out with research to obtain better scientific evidence than heretofore has been available on the overall payoff in driver education or the differential payoff among alternative driver education techniques.

EVIDENCE ON RESOURCE ALLOCATIONS

Let us not kid ourselves; conclusive scientific evidence on driver education is not widely prevalent. But driver education still cannot be described as an activity that has failed to produce payoff in fewer deaths and injuries. If there has been a failure, it is in there not having been mounted as yet a research effort capable of yielding conclusive answers - yea or nay - on the overall effectiveness of driver education, or on the comparative effectiveness of alternative driver education techniques.

We have repeatedly asked experts to advise on what the allocation of resources should be between behind-the-wheel and classroom instruction. We have received opinions and, of course, have taken them into account as the best subjective judgments of our experts. But even the experts do not agree among themselves, and none offers conclusive scientific evidence in support of his position.

We can complicate matters further. Instead of limiting the inquiry to the simple issue of behind-the-wheel versus classroom dollar investments, we can inquire how methods used by commercial driving schools compare in effectiveness with those used by public and non-public secondary schools.

Or we can consider some of the startling new developments that have begun to revolutionize the art of modern teaching -- television, electronic teaching laboratories, self-instructional devices, instructional packages of various types, computers, data and data transmission systems, new library technologies.

What are the criteria for allocating resources among these devices? Should we put money into them in contrast to providing better training to the teachers?

Possibly a better investment than either improved devices or teacher training would be to upgrade behind-the-wheel training to include proper handling of vehicles in skids and other situations of impending loss of control.

And there is the additional intriguing idea that possibly we should begin to place more emphasis on affecting driver performance by new approaches to driver licensing -- using this as an instructional rather than a selection mechanism.

Until the data are available, there can be no sacred cows in driver education. This is the unequivocal position of the Bureau. All reasonable options must be examined carefully, and as a corollary, no reasonable option is to be foreclosed arbitrarily. Far too little is known about the field and the effectiveness of alternative approaches.

In illustration, comparatively soon after the legislation was enacted one state proposed to use non-degree teaching assistants, so-called "paraprofessionals," in driver education programs in its secondary school system. In the face of strong opposition, the Bureau approved the request and is watching this program carefully, for clearly the findings of this experiment carry major implications for other driver education programs.

Another possibility that has been discussed, although not acted upon, relates to using other "paraprofessionals" for behind-the-wheel training in driver education programs. It is obvious that a truck driver or taxi operator who drives hundreds of thousands of miles year in and year out without an accident knows something about safe driving skills; whether or not he has a college degree is irrelevant. The relevant issue is whether he can communicate these skills to student drivers as effectively as a trained teacher. He might be better, or he might be worse. But a closed mind to reasonable alternatives is hardly conducive to progress. The idea is expressed most succinctly in the following quotation by T. M. Stinnett:

> *"The free mind is a troubled mind. Only the comfort of the unchanging mental rut produces complacency. Only a stagnated or regimented society is an uncritical society. The quest is progress, for the better way to human living must always be fraught with doubts and apprehensions and with the squeamish squeals of those who liked what they had yesterday, who want to find it in its accustomed place today and tomorrow."*[1]

Neither driver education nor any other important aspect of highway safety can afford this comfort of an unchanging mental rut and a resulting complacency.

THE ROLE OF COMMERCIAL DRIVER TRAINING SCHOOLS

But if there are to be no sacred cows in driver education as practiced in public and non-public secondary school systems, neither must there be any sacred cows in commercial driver training school practices.

I need only remark that, to the best of my knowledge, attempts to evaluate effectiveness in commercial driving schools have not been any more rewarding than those directed toward driver education in secondary schools. The necessity for unemotional, factual evaluation is no greater or no less for the totality of driver education and training regardless of where it is practiced. Thus, the National Highway Safety Bureau has undertaken broad-scale research to determine methods by which the effectiveness of driver education programs can be assessed.

Let me reiterate that I now see nothing that comes close to refuting the position of the Bureau that commercial driving schools meet a very important need of the overall highway safety effort. Furthermore, the Bureau is fully cognizant of the ways in which the commercial driving schools have been endeavoring to improve their standards, largely through the efforts of your professional association. This indicates real progress.

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[1] *T. M. Stinnett, Keynote Address for 1954 Series of Regional T.E.P.S. Conferences, National Commission on Teacher Education and Professional Standards, NEA, Washington, D.C., The Association, 1954.*

We believe, however, that the Bureau can and must provide assistance and guidance in learning more about the quality of driver education and training programs wherever taught, or by whom. This is a central reason for requesting that one part of this symposium be directed specifically to commercial driving schools.

Among the several important objectives of this symposium, one is to provide for a two-way flow of information between leaders in the commercial driving school community and the government safety program planners at the state and local levels, as well as the Federal level. A forum is needed at which the major issues in this field from the standpoint of the commercial school can be discussed. Only you can provide us with your perspectives, and we, in turn, must communicate to you any shortcomings that we believe need your attention.

EVALUATION OF PROGRAM QUALITY

The identification of program shortcomings is, of course, tantamount to the evaluation per se of the program. This leads to the last topic I would like to discuss today, specifically, the Bureau's approach to this problem of evaluating the quality and effectiveness of driver education -- again without regard to where taught, or by whom.

In the spring of 1967 we contracted with four agencies to develop plans for evaluating the effectiveness of current or proposed driver education programs. These agencies were the American University, Dunlap and Associates, Inc., the Institute for Educational Development, and New York University. The results of these studies, each in response to the same work statement, have been reported to you by their principal investigators.

The National Highway Safety Bureau then requested the National Academy of Sciences, Highway Research Board, to synthesize the common elements and the unique features contained in the four reports and to recommend coordinated plans for evaluating driver education programs on a national basis. This work is now in progress, and based on the final report, which is expected shortly, the actual implementation of evaluation plans for driver education and training programs will then be started.

A fundamental Bureau objective in sponsoring this program is to produce for use by the states tools that they can apply in self-evaluations of their driver education and training programs. The need is to assist the states in assessing the effectiveness of their efforts in this field and to ascertain how driver education shapes up as a family of countermeasures, in competition with other countermeasures, such as motor vehicle inspection or police traffic services, for limited budgets and other resource allocations to safety.

The need for effective procedures for self-evaluations is no less important for the driver education and training groups. The commercial driving school operation constitutes an "industry" in the fullest sense of being private ventures that have a product to sell. The parallels to other industries are quite clear.

To survive in any competitive marketplace, a company must be marketing a competitive product, but it must also be able to evaluate the quality of its product realistically. The fastest way for a company manufacturing poor quality radios, let us say, to go out of business is to maintain false illusions as to the true quality of its product.

But assessing the quality of a driver education and training program is an infinitely more difficult task than measuring the quality of radios. Furthermore, a consumer can readily tell whether or not the radio is working properly. But in the case of driver education as well as other safety programs, the community cannot as yet tell whether it is buying the proverbial pig in a poke or a truly useful product.

For this reason, the Bureau has chosen a course primarily directed toward the development of evaluation tools in contrast to concentrating on discovering some form of "ex cathedra" pronouncement of optimum techniques for the conduct per se of driver education and training.

If we are successful in developing tools that produce reliable evaluations, the obvious next step is to encourage the states to apply them to all competing approaches -- whether in secondary school systems or in commercial driver training schools. The programs that prove out should be supported; those that don't should be dropped, or at least be required to be "beefed up."

To speak with complete candor, I believe that proper evaluation tools ultimately will show that some elements of driver education in secondary schools are weak and ineffective while others are highly effective. Proper evaluation tools will produce similar results when applied to commercial driver training schools.

The overall state program will then move toward a combination of the best elements of both. For it is clear, as I stated earlier, that there always will be a need for the kinds of service provided by both.

CONCLUSION

To conclude, I would repeat my earlier statement that, if for no reason other than that our resources don't permit it, there can be no sacred cows in highway safety. No silver bullets, magical nostrums, or panaceas.

I do not know, for example, but that we should begin to reexamine even state organizational taboos that carefully compartment driver education, driver licensing, and the traffic courts system that has to deal with the failures of the first two.

I believe in driver education. But at this point in time I believe at least as much in driver education research, oriented toward the development of tools for the reliable evaluation of program effectivenss. The tools are needed because driver education is in competition in the fullest sense of the word for the very limited safety dollar.

Payoff evidence, not emotional appeals or heuristic arm waving, will be required for driver education to hold a place in the all-important allocation of resources among competing countermeasure alternatives for reducing traffic deaths and injuries. And I am not so sure that it will win with emotional arm waving. Even if I restrict my alternatives to the safety investment by the typical school district, I must ask for the criteria for investing in the upgrading of driver education in contrast to, say, investing in improved maintenance of school bus brakes.

It would be interesting to poll this audience on this simple question -- more money on school bus maintenance or more money on driver education, but not both because the money for both simply is not there.

It would also have been interesting to have polled the citizens around Huntsville, Alabama, on this same question last April when a school bus there lost its brakes, went out of control, and four or five children were killed, others seriously injured.

It might even be more interesting to poll those same people near Huntsville on the same question today. For another school bus there lost its brakes about a month ago or so, and more children were killed.

We might even ask how the drivers of those buses were taught to drive -- in secondary schools, in commercial driving schools. Or, as most likely, did they pick it up from their parents?

No, I am not sure that driver education, whether in secondary schools or commercial driving schools, will do well on emotion alone.

These are brutally tough investment questions that have to be attacked with all of the intelligence, judgment, and research skills that we can command. For they are not going to solve themselves.

And, as I stated to those at the first symposium, if the advocates or opponents of one safety countermeasure or another choose to ignore such questions, I do not believe that the public or the government at Federal, state, or local levels will. At least, not for very long.

SAFETY SPECIALIST MANPOWER FOR DRIVER EDUCATION

Tommy L. Bertone
Booz, Allen and Hamilton, Inc.

Mr. Bertone, a consultant in the Institutional Management Division of Booz, Allen & Hamilton Inc., graduated cum laude from Harvard College with a B.A. degree in government and from Stanford University with an M.A. degree in political science. He has also done graduate work in public administration at The George Washington University.

Prior to joining the firm, Mr. Bertone was a Budget Examiner with the U.S. Bureau of the Budget in Washington, D.C. He had complete Bureau staff responsibility for several Department of Defense programs and appropriations. He was also a Management Analyst for the Comptroller of the Army in Washington, D.C., and for the 8th U.S. Army Comptroller in Korea. In this capacity, Mr. Bertone participated in management improvement studies and in the administration of Army management engineering programs.

Mr. Bertone is experienced in the functional areas of economic analysis, planning, programming, and budgeting, and in management engineering. He recently acted as project manager for a study of safety specialist manpower for the Federal Highway Administration, U.S. Department of Transportation, that will provide a comprehensive picture of the present and future availability of personnel to carry out the state highway safety programs. Mr. Bertone participated in preparing program manuals which will be issued by the National Highway Safety Bureau to provide guidance to state and local governments on implementation of the Highway Safety Program Standards.

INTRODUCTION

In preparing this paper, I vividly recalled my first encounter with driver education. I was 14. My father and I were traveling on a two-lane highway between Joplin, Missouri and Pittsburg, Kansas. He was driving, but shortly after leaving Joplin, pulled over to the shoulder and announced that it was time I learned to drive. I got into the driver's seat and began. I quickly saw that, because of my height, it was more convenient for me to peer at the road through, rather than over, the steering wheel. Very soon, my speed got out of control, my foot seemed to freeze on the accelerator, and the car weaved and nearly went into the ditch. We were saved when my father grabbed the wheel. I continued my lesson but noted that cars seemed leery of approaching and passing. Thinking back on this, it is easy to conclude that there must be a better way.

Congress itself concluded that there must be a better way, and in 1966 it passed the Highway Safety Act. A national purposeful commitment to highway safety was envisioned.

Following the passage of this act, officials at Federal, state, and local levels began to expand existing highway safety efforts and to initiate new safety programs. As part of its initial research activities, the National Highway Safety Bureau issued a contract for a study to examine the overall task of staffing state government highway safety programs. My firm, Booz, Allen & Hamilton, Inc., received the contract award and conducted the study between June, 1967, and October, 1968. This study, entitled the Safety Specialist Manpower Study, examined the following:

- Manpower requirements
- Manpower resources
- Manpower training capacity
- Manpower staffing actions

The work of the Safety Specialist Manpower Study as it applies to driver education manpower requirements and staffing actions is presented in this paper in the following sections:

- Study framework
- Safety specialist jobs in driver education
- Manpower requirements in driver education
- Possible actions to assure adequate driver education staffing

STUDY FRAMEWORK

The Safety Specialist Manpower Study is characterized by four primary features.

First, the study is concerned with employees of state governments. Although the highway safety program embraces Federal, state, and local government employees, the scope of the Safety Specialist Manpower Study was initially defined to include only state government personnel. Driver education teachers and driver education supervisors are normally not state employees, but were added to the study as exceptions at the special request of the National Highway Safety Bureau. The study, nevertheless, remains largely concerned with state employees, and no personnel of commercial driver education schools are included.

Second, the study is concerned with safety specialists. Only personnel whose duties require technical knowledge of highway safety principles and practices are included in the study. Technical knowledge is defined as knowledge which is uniquely relevant to carrying out one or more highway safety programs and for which specialized formal training is required. Such knowledge is usually acquired following recruitment, although for several job titles, such as driver education teacher and driver education program specialist, substantial specialized training can be acquired prior to recruitment. On this basis many people employed in highway safety work, such as clerk-typists and computer programmers, are excluded from consideration. Thus, the Safety Specialist Manpower Study does not include all persons employed in driver education and other highway safety programs, but only those whose jobs require specific safety knowledge and training.

Third, the study is organized in terms of the National Highway Safety Program Standards, which are being used as guidelines by highway safety officials at both state and Federal levels. For this reason, the data in the Safety Specialist Manpower Study are organized and presented in terms of programs corresponding to the Standards, one of which is for driver education. Driver education safety specialists and manpower requirements are separately discussed and identified.

Fourth, the Safety Specialist Manpower Study is based on information from personal interviews with state officials. Between October, 1967, and March, 1968, field visits were made by Booz, Allen & Hamilton staff to all 50 states. Visits in each state ranged from 9 to 17 days, with an average visit of 13 days. Interviews were held with the governor's highway safety representative and with operating officials in charge of each safety program. Thus, data on the high school driver education program were typically acquired from the official in the State Department of Education responsible for the program. Information on other Driver education programs was also obtained from the state officials responsible for the programs.

Acquisition of data was aided by the use of interview questionnaires. Questionnaires were developed by Booz, Allen & Hamilton staff during the initial stages of the study and drew on the advice and recommendations of officials in public and private agencies involved in highway safety. Information from the National Education Association, for example, was helpful in preparing the driver education questionnaire. Prior to the field visits, three pilot trips were made to California, Minnesota, and Massachusetts to test draft questionnaires. After questionnaires were modified in accordance with experience gained during the pilot visits, four types were finally used in interviews:

- A program questionnaire was used to gather data describing each highway safety program in the state.
- A manpower requirements questionnaire was used to gather data on the types and numbers of manpower required in each program.
- An institutional questionnaire was used to gather data on highway safety training in colleges and universities.
- An in-service questionnaire was used to gather data on highway safety training in programs of state government agencies.

The questionnaires and interviews provided the information used in the analytical stages of the study.

SAFETY SPECIALISTS IN DRIVER EDUCATION

One of the objectives of the Safety Specialist Manpower Study was to identify the types of people required in highway safety programs. Required types of personnel were to be identified by job title, and job descriptions for each type were to be provided.

Based upon the interviews in the states and on our own analysis of highway safety programs, 36 safety specialist job titles are defined. These job titles apply to the entire complex of highway safety programs, and several of the titles are applicable to more than one program. Job titles were identified in the light of actual state practice and after consideration of the work functions that must be performed and the training pertinent to the performance of functions.

A formal job description is presented for each of the 36 job titles. Job descriptions delineate the scope and duties of a job and the extent and content of required education, experience, and training.

In driver education, four job titles and descriptions are presented, as follows:

- Driver education program specialist
- Driver education supervisor
- Driver education teacher
- Driver retraining instructor

The driver education teacher is the basic job title in the program and defines the requirements of education and experience upon which the other job titles build. The teacher provides instruction to high school students in the approved secondary school driver education programs and to adults in the beginning adult program.

Minimum education requirements for the teacher are a bachelor's degree in secondary education and 18 semester hours in driver and safety education and related fields. These requirements have been drawn from National Highway Safety Bureau guidelines presented in the forthcoming Highway Safety Program Manuals.

The driver retraining instructor provides remedial driver instruction to problem drivers. He also inspects commercial driving schools and handles the licensing of commercial school teachers. Minimum education requirements are the same as for the driver education teacher, but, in addition, experience of at least three years teaching in the high school driver education program is required.

These education and experience requirements for the retraining instructor represent an upgrading of typical current requirements. It is not unusual today to find remedial instruction programs manned by ex-driver's license examiners. In our judgement, the task of providing retraining is at least as difficult and important as that of providing beginning instruction. Therefore, at least comparable education should be required of driver retraining instructors and driver education teachers. A need for mature personnel in this job title accounts for the requirement of three years experience.

The driver education supervisor provides continuing local supervision of the high school and adult education programs. This job requires a master's degree in driver or safety education, with courses in program administration and at least two years' experience as a driver education teacher or the equivalent.

The driver education program specialist is a program administrator. He is responsible for formulating, managing, and evaluating all state programs in driver education, including high school and adult training, driver retraining, and supervision of the commercial school program. He may also provide consulting services to driver education supervisors and in-service training to driver education teachers and retraining instructors. This job requires a master's degree in driver or safety education, with courses in program administration and at least three years' experience in driver education programs.

The four job titles, then, represent the safety specialist in the driver education program.

MANPOWER REQUIREMENTS IN DRIVER EDUCATION

A second objective of the Safety Specialist Study was to estimate the required number of safety specialist personnel by job title for each year from 1968 to 1977. Estimates were to be made for each state and in the national aggregate.

Adhering to these guidelines, the study presents three estimates for each job title:

- A state estimate
- A realistic maximum estimate
- A realistic minimum estimate

The state estimate was obtained from state officials during the field visits. Employing their "best judgement", these officials were asked to provide estimates of annual requirements according to their perceptions of programs and future needs. However, the National Highway Safety Program was a relatively new program at the time of the field visits and state officials were often understandably unprepared to offer firm estimates. Therefore, state data for driver education requirements, as well as for other programs, are incomplete.

In addition to the state estimates, the study presents estimates developed independently by Booz, Allen & Hamilton. To understand the derivation of these estimates one must bear in mind that the number of persons required in any program is dependent upon what someone wishes to do and how he intends to do it. For example, in driver education the number of teachers required to provide 70 clock-hours of classroom instruction to all eligible students will differ from the number required to provide 30 clock-hours of classroom instruction to the same number of students. To derive requirement estimates it is necessary, then, to define the specific content of the programs.

For each safety specialist job title, the study defines two programs. One of the programs is defined to produce realistic minimum manpower requirements, the other to produce realistic maximum manpower requirements. Taken together, these two alternatives provide a range of manpower requirements within which actual state manpower requirements should fall. The number of personnel actually required by a state will depend upon the program that the state in fact selects to implement, which could be one of 30 hours, 50 hours, or 70 hours of classroom instruction, for example.

The definition of minimum alternatives was guided by the National Highway Safety Program Standards. Minimum alternatives are those which produce minimum personnel requirements, yet meet the provisions of the Standards. Maximum alternatives were defined by drawing upon the more advanced plans and ideas encountered in the states. These plans and ideas were adapted by Booz, Allen & Hamilton to produce realistic maximum manpower requirements.

The derivation of minimum and maximum estimates required three steps: the definition of programs in writing, the translation of these written program descriptions into mathematical formulas, and the use of the formulas to calculate requirements. It is important to note that factors and ratios used in the formulas were empirically derived from data gathered during the state visits.

Let us look more closely at the alternatives for driver education.

For the driver education program specialist, the maximum alternative provides sufficient manpower at the state level to develop and evaluate in detail all driver education programs and to offer consulting services to driver education supervisors. The minimum alternative provides only enough personnel to review driver education programs developed by the school districts.

For the driver education supervisor, the maximum alternative provides sufficient personnel to assure continuing local supervision of high school and adult driver education programs, including in-depth aid to school districts in formulating, executing, and evaluating programs. It assumes one supervisor for 20 school districts and a minimum of one supervisor per county. The minimum alternative also provides for supervision of high school and adult driver education programs, but assumes only one supervisor per county.

For the driver education teacher, the maximum alternative provides sufficient personnel to offer all eligible students 30 clock-hours of classroom work and six clock-hours of practice driving instruction with no summer sessions. The minimum alternative provides enough teachers to instruct all eligible students in 70 clock-hours of course work and 10 clock-hours of practice driving. It assumes summer sessions and a system of driving ranges sufficient to allow each teacher to supervise six cars simultaneously. The use of driving ranges reduces manpower requirements even though more hours of instruction are provided to students.

For the driver's license retraining instructor, the maximum alternative provides sufficient manpower to offer 12 hours of instruction per student. The minimum alternative provides sufficient manpower to offer 8 hours of instruction per student.

Using the alternative, the national aggregate manpower requirements in 1968 and 1977 for the entire Driver Education Program are the following:

	1968	1977
State Estimate	26,350	34,252
Maximum Estimate	26,038	40,070
Minimum Estimate	14,007	20,942

The state estimate calls for a few words of explanation. First, it should be recalled that the driver education teacher and driver education supervisor job titles were not included in the study from the beginning, and estimates from all states were not collected. Second, the state estimates for driver education teachers includes part-time as well as full-time teachers, while the minimum and maximum estimates assume only full-time teachers. Thus, data included in the state estimate are not completely comparable to data included in the maximum and minimum estimate.

These estimates represent the manpower requirements in driver education for which staffing must be provided.

STAFFING ACTIONS

The Safety Specialist Manpower Study examines the availability of manpower to staff safety positions and concludes that sufficient manpower should be available. It also points out, however, that staffing of requirements is not simply a matter of having a sufficiently large manpower pool. Such factors as the management priority placed upon highway safety by state officials could have an enormous effect upon determining whether requirements are filled. Drawing upon these factors, the study concludes that, in general, it seems reasonable to expect minimum requirements to be met, but it is doubtful that maximum requirements can be filled. For some programs, difficulty may even be experienced in filling minimum requirements. This is true for the Driver Education Program.

As pointed out earlier, the basic job title in driver education is driver education teacher. Theoretically, the manpower resource pool for this job title is more than adequate. The pool is composed of primary and secondary education teachers. The problem is influencing teachers and potential teachers to pursue a career in driver education. In the past, there has been reluctance on the part of some career teachers to concentrate in driver education.

Traditionally, the task of staffing driver education jobs has been performed by relying upon part-time instructors in secondary driver education programs. Often, teachers in other education programs take qualifying driver education courses during the summer and then teach driver education as a secondary duty during the school year. This approach has been possible because of minimal course requirements for qualification. Now, however, educational requirements have been raised to 18 semester hours. With these increased requirements, it is doubtful that complete reliance upon part-time teachers will continue to be a feasible approach. Teachers have been reluctant to enter driver education under minimum education requirements. It seems unlikely that they will become more receptive as requirements are increased.

How might this potential staffing deficit be overcome? The Safety Specialist Manpower Study identifies three possible actions:

- Establish a driver education career field
- Encourage technological improvements and thereby reduce manpower requirements
- Establish programs to finance necessary teacher training in driver education

To establish a driver education career field, the Safety Specialist Study defined the education and experience of driver education teachers to be applicable to 9 of the 36 safety specialist job titles. That is, 9 of the 36 job descriptions specify education and experience requirements similar to those of driver education teachers. This increased career potential should provide teachers with greater incentive to enter driver education.

Greater reliance upon technological improvements to reduce teacher requirements is also suggested. The minimum alternative for the driver education teacher job title employs driving ranges as a method of reducing teacher requirements. Should states experience shortages of full-time driver education teachers, greater reliance upon such technological improvements to reduce teacher needs can be considered.

As a further step, states could consider programs to finance the driver education training required of teachers. With training being supplied at no cost and substantial career opportunities available, teachers should find persuasive arguments for entering driver education.

The Safety Specialist Manpower Study examines the capacity to train personnel for each safety specialist job title. This portion of the study consists essentially of inventorying selected colleges and universitites for safety education offerings and comparing enrollment capacities in identified offerings with manpower requirements. Suffice it to say that major conclusions are as follows:

- For required entering education, sufficient existing or planned capacity exists to prepare manpower for both minimum and maximum levels.
- For training beyond entering requirements, capacity must be increased for all driver education job titles.

CONCLUSION

To develop manpower and training requirements for highway safety, it is necessary to know the specific content of programs. From knowledge of program content, a description of functions and personnel duties can be obtained. With this information available, it is then possible to estimate both the numbers of manpower and the training necessary for personnel to perform assigned duties. Manpower and training requirements are dependent upon program content.

The Highway Safety Act and the resulting National Highway Safety Program standards envision improved and expanded highway safety programs. The Safety Specialist Manpower Study indicates that the thrust toward an improved program in driver education has produced significantly increased training requirements. These increased requirements in turn may lead to deficits in staffing driver education programs. To prevent deficits, the study suggests the creation of a driver education career field.

This suggestion, it seems to me, is of great interest to participants in this symposium. As driver education teachers, you must have thoughts about the creation of driver education as a career field in state government personnel systems. You most certainly have a major contribution to make concerning such problems as:

- The advantages and disadvantages of a career field
- The content and structure of such a career field
- The processes for establishing a career field

In my opening remarks, I spoke of a "better way" to driver education. If that "better way" is to become available to all students who want it, your efforts can be helpful and perhaps even decisive. I would urge you, therefore, to undertake an active role in improving the supply of driver education manpower.

EVALUATION OF DRIVER EDUCATION - TELLING IT AS IT IS

Leon Brody
Director of Research
The Center for Safety
New York University

Dr. Brody is presently Associate Director of The Center for Safety, New York University. He has been a Professor of Education and Director of Research at The Center for Safety since January, 1952. He is a member of the University Senate, a member of the Committee on Doctoral Research Design, School of Education, and a member of the Committee on Selection of Doctoral Candidates, School of Education.

He received a B.A. from the College of the City of New York in 1931, where he was also awarded his M.S. degree in 1933. He received his Ph.D. in psychology from Duke University in 1937.

Prior to his present position, Dr. Brody was employed by the industrial relations department of the Great Atlantic and Pacific Tea Company from 1946-1951. He was a Senior Training Technician for the War Department from 1941-1945, and a Research Associate at the Center for Safety Education, New York University, from 1940-1941. From 1937-1939 he was a Research Assistant for the American Association for Adult Education, and he was Assistant Director of Research for the U.S. Office of Education from 1936-1937.

His professional affiliations include the Chairmanship of the Research Committee, American Society of Safety Engineers; Chairman of the Division of College and University Safety Centers, National Safety Council, and member of the American Psychological Association (Certified Psychologist, the State of New York).

Dr. Brody has been the author or co-author of books and articles on highway safety, industrial safety, adult education, research methodology, and psychological and medical subjects, and he has been the principal investigator in various projects concerned with highway and industrial safety.

Is it possible at this time to determine with scientific confidence the accident reduction value of driver education? Current limitations in research technique, as well as some theoretical considerations, suggest it would be undesirable to try to do so.

This is not to imply that driver education has no value. Nor should we be intimidated by weaknesses in present methods of accident reporting or population sampling, by difficulties in equating control and experimental groups in essential variables such as initial interest in learning to drive well, or by the complexities of adequate statistical treatment. Certainly we must recognize that the ultimate objective of driver education is to reduce the frequency and severity of traffic accidents.

But, to be practical, we must take into account (1) the role of chance in accident occurrence, (2) the influence of social environment on and off our streets and highways, (3) the absence of demands that other courses of study be similarly evaluated in terms of their ultimate objective, and (4) the greater need to assess driver education with a view to improving instructional programs. In addition, it is essential that we establish the possible intervening influence of changes in highway design and engineering, traffic law enforcement, motor vehicle design and administration (including inspection), and other variables that could account in part for trends in accident involvement and frequency of violations. Only then can we be absolute in our statements regarding driver education.

Nevertheless, since the purpose of the requested research design was to indicate ways and means of determining both the immediate and longer range effects of driver education on selected criteria, comparisons were suggested between the measurements taken at various time slices (i.e., upon entering the course, immediately after completion, 2 years later, and 5 years later). The appended schematic (Figure 1) represents the measurements to be applied.

From these measurements, curves can be plotted over time to compare the means of the groups (receiving and not receiving driver education) on the various criteria. Utilizing such plots, both the differences between the groups at a specific time period, as well as the differences between the groups and variables over time, can be analyzed for significance.

It should be obvious that any such proposed research design would be highly elaborate and that its execution would be an expensive procedure.

An alternative technique that would be much less costly is outlined below. However, this technique is concerned more with the relative, immediate effectiveness of different programs of driver education than with "actual" effectiveness of driver education _per se_ (or as a "whole") in terms of accident reduction.

Recognizing that the operation of a motor vehicle is _learned behavior_, the question of whether or not driver education should be carried on becomes meaningless, since all motor vehicle operators are the product of some form of driver education -- formal or informal. The question to be decided is rather what specific form or forms should driver education take in order to attain its objectives with greater effectiveness and efficiency.

On the basis of both cost and feasibility, a design may be recommended that assumes the importance of driver education but does not, for reasons previously stated, seek to explore the long-range effects of driver education. This design is illustrated in the accompanying figure. (Figure 2)

The first step required by this design is one that has often been mentioned as sorely needed: a _definition of the driving_

SHORT-TERM AND LONG-TERM PROGRAM

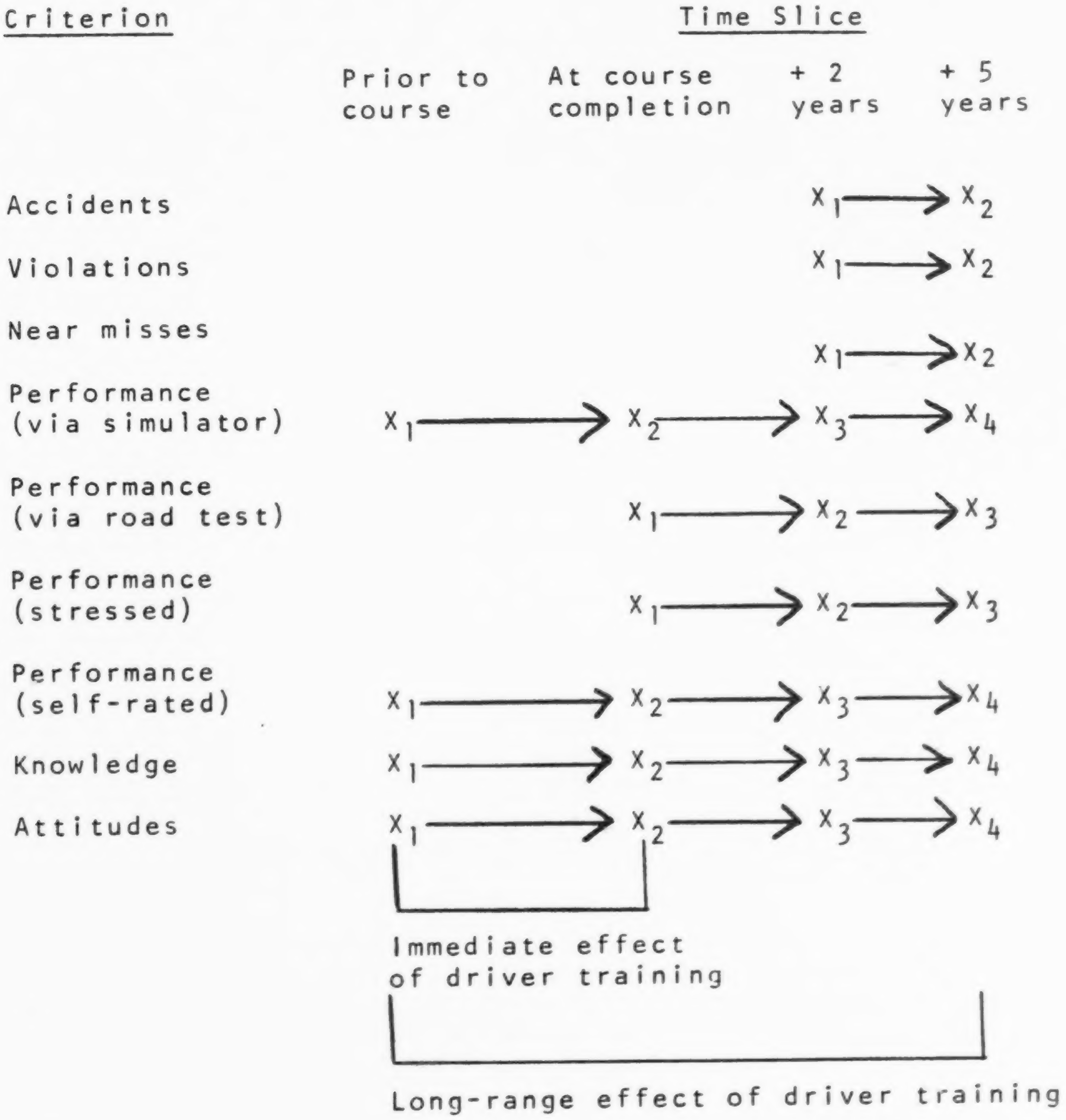
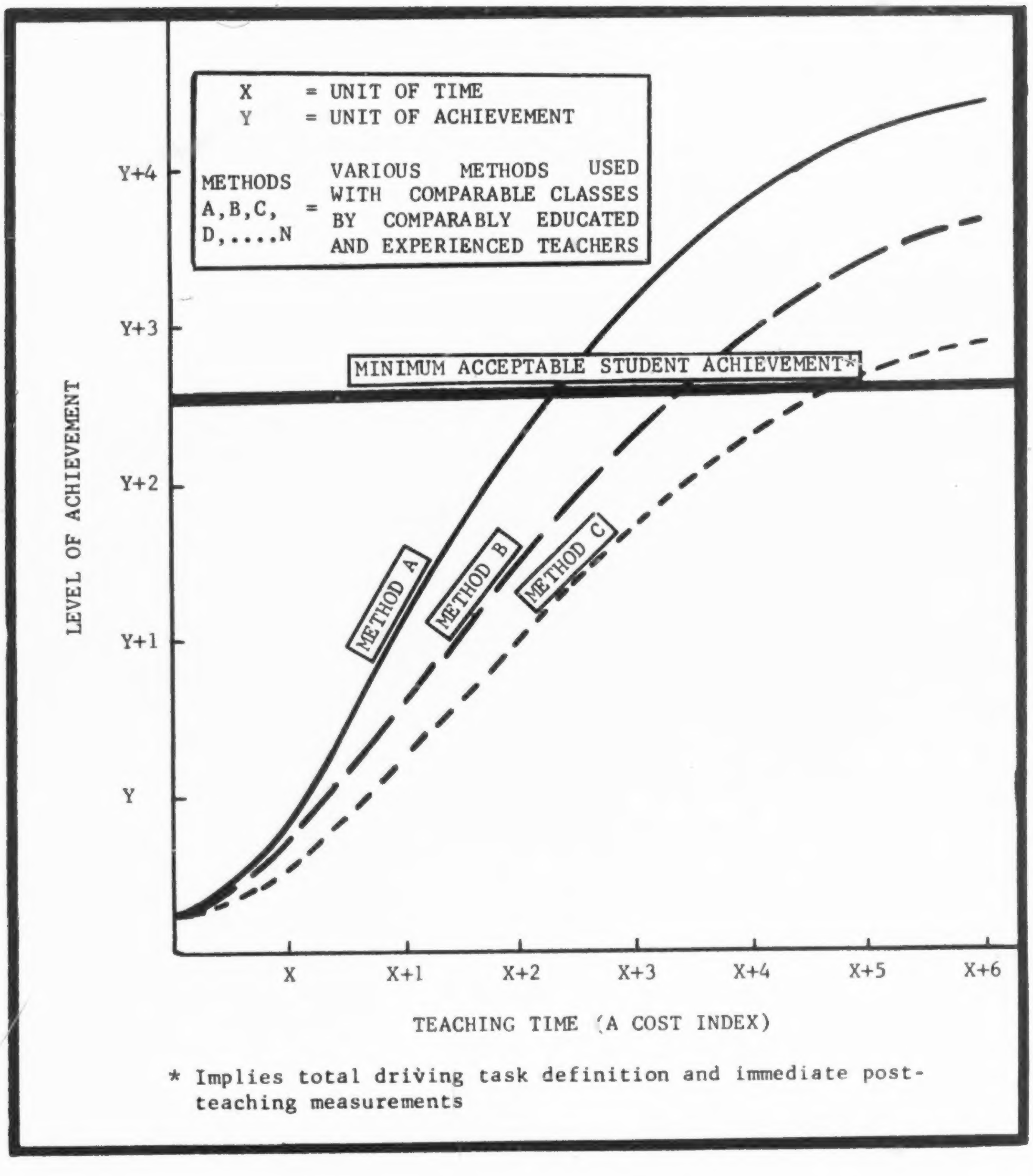

Criterion
Time Slice
Prior to course
At course completion
+ 2 years
+ 5 years
Accidents
Violations
Near misses
Performance (via simulator)
Performance (via road test)
Performance (stressed)
Performance (self-rated)
Knowledge
Attitudes
X_1
X_2
X_3
X_4
Immediate effect of driver training
Long-range effect of driver training

Fig. 1. Short-term and long-term program.



* Implies total driving task definition and immediate post-teaching measurements

Learning Curve: Design for Determining Relative Cost Effectiveness of Differing Methods (Objective: the identification, on a cost basis, of "better" not "best" approach.)

Fig. 2. Learning curve.

task (as a whole, not just as a matter of skills). If, for example, one refers to the development of an understanding of traffic control as one of the components of the driving task, it becomes necessary not only to formulate the objective of this component, but also to itemize what may be termed "behavioral outcomes" of this phase of driver education. These need to be precisely stated, represent the main objective, and worded so as to suggest possible measurement of achievement, or learning, during and upon completion of a driver education program.

The next important steps would be as follows:

(1) Establishment of a minimum acceptable student achievement for each component (initially, at least, this would have to be a matter of expert opinion);

(2) Development of adequate measuring instruments for each of the components;

(3) Development of a research design for comparing the teaching time (a cost index) required by each of n methods, under otherwise comparable conditions, for attainment of the desired level of student achievement;

(4) Execution of the research design.

This alternative proposal is highly recommended for reasons set forth above. It is not identified as the preferred evaluative technique only because it does not concern itself with accidents *per se* as the essential criterion. But the limitations of the latter criterion, for practical purposes, are forbidding.

In any case, faulty practices (and traffic violations) are much more abundant, and should provide more valid conclusions than accidents *per se*. It seems axiomatic that poor driving will sooner or later lead to accidents. It would follow that *good* practices should be made the essence of driver education programs and the principal criterion of their effectiveness.

If the above suggests a negative view of the truly preferred approach to an evaluation of driver education, i.e., through reference to the accident-reduction criterion, that is not at all the case. It is a question of feasibility and logic.

There is already ample "evidence" that, if we seek to evaluate driver education in terms of accident reduction, we are confronted with so many variables, known, unknown, and highly variable if not unpredictable, that we become enmeshed in an endless chain of proof. While it is true that there have been scores of "causal" evaluative studies seriously lacking in soundness of design, others conducted by reputable researchers have come up with conclusions that are so qualified with "but's", "if's", and "maybe's" as to render them practically insignificant.

In general, accidents are so varied in the circumstances surrounding them, with so many factors, potentially, contributing to their occurrence, and with such limitations (at present) on the availability of adequate accident data, that no one factor or set of factors can be expected to be prominent statistically to any great extent. Hence it is not uncommon for a researcher to report that he has found it impossible to separate the influence of a given program from the influence of other factors (or programs) on reported accident data. Such considerations tend to support the conclusions set forth in this paper.

SUMMARY AND CONCLUSIONS

1. Performance of any task must be learned.

2. Therefore, debating the need for driver education, whatever its nature, is purely academic -- a tempest in a teapot.

3. There is, to date, no incontrovertible evidence of a scientific nature that driver education has or has not reduced highway accidents.

4. The problem that does exist is how to accommodate driver education in educational systems public and private.

5. The problem also exists of how to improve the structure of such programs, continually, so as to improve the quality and efficiency of learning. Here I think we can say that the most critical part of driver education is a matter of teacher preparation. Because if we don't have competent, motivated educators, we might as well give the kids back to their parents for driving instruction.

6. Guidelines toward the latter objective are presently derived largely from subjective recommendations of experienced instructional personnel.

7. Because of the complexity of the traffic safety problem as a result of the many variables involved, the potential of experimental or quasi-experimental studies to provide bases for guidelines remains undetermined, and this is likely to be the case for some time to come.

8. The next point seems to support our views by analogy. Using a model relating vehicle component failure and inspection effectiveness parameters, researchers at the University of Michigan's Highway Safety Research Institute hypothesized that "an annual motor vehicle inspection system should have little effect on the defect rates of those components which fail frequently but are easily detected and rather readily ... repaired by owners" (for example, lighting systems). And indeed results of their investigation suggest that such defects may be better controlled by increasing the fault detection rate of owners. This is a matter of driver education. Finally, these researchers concluded that the ultimate determination of cost effectiveness of vehicle inspection sums "seems to be unsolvable at the present time. Yet inspection will become operative in many more states

in the near future." I think we see here a parallel to requested evaluation of the achievement, or potential, of driver education.

9. And now, in a broad sense, I should like to call your attention to a presumably new approach to social change -- and really, for some time to come, human and therefore social change is what we are concerned with. This approach has usually been called "systems analysis." What are the prospects? Well, at the end of a three-day forum of systems analysts and engineers just about a year ago, a pessimistic note was sounded. The incoming president of the group put it this way: "We're very good at hardware and tactical problems ... We're lousy at strategic and philosophical problems. We need to put all of our social scientists ... all our people-oriented people to work on these problems." And I am inclined to say that this includes bona fide driver educators.

I think that you will find these statements provocative, if not helpful. Thank you.

PLANS FOR EVALUATING DRIVER TRAINING

Leon Brody[1]
Director of Research
The Center for Safety
New York University

The task assigned to us by the Department of Transportation was to develop one or more plans for evaluating the effectiveness of driver education.

Well, driver education comes in many shapes and sizes. So one of our first steps was to ascertain the nature and dimensions of what we might have to evaluate. For this purpose we decided to turn to the driver education achievement reports of the Insurance Institute for Highway Safety. They had been compiling these reports for 20 years -- on a national basis, and it was a year-round activity. So we felt that on the basis of length of experience alone, no other source of information was likely to be superior, at least insofar as public school programs were concerned.

We recognized, of course, that the data in these reports were concerned with program characteristics, and NOT with program quality. That was fine for our purposes. After all, the four contractors received substantial sums of government money to develop plans for evaluating program quality and effectiveness.

So we worked up a broad picture of what had to be evaluated.

But now another hurdle. Just what did evaluation mean? To put it another way, what criteria of effectiveness could or should be employed? Accident reduction alone? Or should we include other things--such as proficiency in real driving performance, proficiency in simulated driving performance, response under conditions of stress, evidence of desirable attitudes, etc., etc.

In our own design we decided upon multiple criteria of effectiveness--that is, the criteria I've mentioned and still others. But because of the nature of these criteria, we felt it was essential to classify them with respect to short-term, intermediate, and long-term measurements (i.e., immediately after instruction, two years later, and five years later).

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[1] *For biographical sketch, see p. 80.*

Needless to say, the criterion problem is a tough nut to crack.

But that is not the only one. One cannot apply such criteria to ongoing programs without recognizing that the results obtained might be due to one or more of a whole batch of possibly related variables. For example, on the basis of previous studies and professional experience, our group decided that it had to take into account in the design such things as initial student interest in taking a driver education course; previous driving exposure; certain personality characteristics; variations in the content and methodology of driver education courses; and certainly the quality of the teaching.

All this added up to a pretty complicated research design -- a design made even more complicated by problems of population sampling.

Well, a sampling strategy was worked out, along with statistical treatments to be applied to the obtained data.

Then, because the complexity of the design and because the possibility that intervening variables having to do with roadway changes, changes in automotive design, and new developments in enforcement and motor vehicle administration could still confound the truth of research findings, (not to mention the probable high cost of executing the research) the principal investigator worked up an alternative design that accepts driver education and training as axiomatically desirable and then concentrates on comparison of different kinds of programs, with a view to identifying and comparing student achievement under these different programs (cf. Figure 2 , p. 83). This alternative design involves a detailed definition of the driving task and immediate post-teaching measurements of student achievement.

Executed in detail, there would be nothing simple about this design either. But it would be far less costly, and much more important, driver education could proceed in the meantime, under both public and private auspices -- but with expectations of continuing improvements and with freedom from fear of an arbitrary axe. I use the term "private" in a broad sense, to include what are commonly referred to as "commercial driving schools." Personally I should think you might prefer "private" in lieu of "commercial."

COMMERCIAL DRIVING SCHOOLS

At the present time there is little information on a national scale, regarding the organization, supervision, and programs of commercial driving schools. Two recent reports of stature may be drawn upon to provide some understanding of this substantial segment of driver education and training in the United States.

According to a document prepared for the United States Department of Health, Education, and Welfare (Report of the Secretary's Advisory Committee on Traffic Safety, 1968), the following is an indication of the dimensions of the commercial school activity:

> *In addition to high-school courses, there has been a steady proliferation of commercial programs ... The National Professional Driver Education Association estimates that 400,000 teenagers and 1,600,000 adults receive instruction in 3,000 commercial schools each year. The average cost of instruction is $9 per hour, and 10-15 hours are usually required. The estimated industry revenue is $255 million annually.*

The second report (Little, 1966) provides a brief comparison between commercial and high school programs:

> *. . . there are no valid estimates available as to how many teenagers are taught by these schools . . . . While the objectives of many of the high school training courses are not only to teach basic skills in handling the vehicle, but also to develop realistic attitudes and acquire knowledge which would contribute to traffic safety, the objective of many commercial schools may be narrower, aiming primarily at meeting the requirements of the state driver-examination. At this time the number of states which have some laws or regulations governing commercial driving schools is 22 . . . Little is known about the quality or effectiveness of commercial driver training schools . . . No doubt, the quality of these schools is as variable as is found among high school driver training programs.*

With reference to the quality and effectiveness of commercial school programs, it is reasonable to expect that the development of a research design for assessing them might be even more complicated than designs for evaluating high school programs, because of the relative lack of information concerning the many variables believed to be involved. Nevertheless, the same kinds of research considerations would obtain in both instances, at least insofar as ultimate highway safety goals are concerned.

Finally, attention must be given to a crucial question: Can the standards recommended for commercial school programs differ from those recommended for high school programs? This question is particularly important in the case of young people, who are acknowledged to have more than their proportionate share of motor vehicle accidents.

GUIDELINES

While we wait for the results of valid research dealing with the many facets of traffic safety, I respectfully suggest that the following guidelines reflect a logical approach to the problem, partly research-based, and that they may have more or less immediate value to practitioners in the field of driver education and training:

1. We need to take into account driving knowledge, attitudes, and manipulative or skill factors.
2. Attitudinal factors require a long-range and multifaceted approach for development or modification through education in and out of the classroom.
3. Because of these requirements, driver educators and trainers should for practical reasons concentrate primarily on the learning of everyday responses or skills in traffic, and the handling of emergency situations.
4. Of course, such instruction should also provide some opportunity for cognitive and attitudinal learning.
5. The handling of emergency road situations, because of their hazardous nature, depends largely on simulated exercises plus some training in off-street areas under supervised conditions.
6. The critical factor in educational effectiveness will reside in instructor competence.
7. Extensive certification requirements for instructors are not necessary.

8. Requirements should include courses in basic and advanced driver education plus a foundations course in methods of teaching. These may be degree or non-degree courses, so long as they are professionally supervised and conducted.

9. Finally, there simply cannot be one best way of teaching to drive. It was difficult enough to come up with the old formula of 30 and 6 for driver education. It could have been 32 and 4, or 26 and 10 -- if you want to add up to 36. But why not 30 and 16? or 16 and 16? Or 10 and 16? And why should these hours be fixed for all? There are individual differences in capacity and background. Student achievement of our immediate goals should be the chief criterion. So, instead of pursuing the end of the rainbow now, the concern of practitioners should be: How well are we doing? How can we do things better? (not "best.")

The latter observation brings us back to the previously mentioned alternative research plan for evaluating driver education and training . . . . the one illustrated in our learning-curve graph. This plan appears to be feasible. If so, it should help to resolve the dilemma posed by the first two conclusions in our full contractual report to the U.S. Department of Transportation. Those conclusions were:

1. No clear proof has as yet been produced showing that driver education, as presently constituted, has a significant favorable effect on driver performance.

2. No clear proof has as yet been produced showing that driver education, as presently constituted, does not have a significant favorable effect on driver performance.

What we need most of all, I believe, is an analysis of the driving task in terms of expected behavioral outcomes of instruction. And then we need to develop tests and instrumentation that will provide relatively objective ratings of student performance. In the meantime, public and private efforts to produce competent drivers must be continued. If their momentum is interrupted, progress in the resolution of this national problem will be much more difficult to resume.

PLAN FOR CRITICAL APPRAISAL OF DRIVER EDUCATION PROGRAMS

Robert L. Chapman
Director of Studies
Institute for Educational Development

Dr. Chapman is presently a Systems Consultant to the Institute for Educational Development, and Project Director of the Driver Licensing Program Project; he was also Project Director on IED's recently completed Driver Education and Training Project.

He holds Bachelor of Science and Master of Science degrees in mechanical engineering and psychology, respectively, from the University of North Dakota, and a doctorate from the University of Chicago in psychometrics, experimental and physiological psychology.

Included in Dr. Chapman's wide range of experience are: systems and cost/effectiveness analysis, system design and development, development and application of analytic and training techniques (including operational gaming, simulation methods, and system training), long-range planning, development of strategies for introducing new products and services, and the design of interventions for promoting social change in civil systems.

Dr. Chapman has twenty-five years of experience with the Hughes Aircraft Company, the Ramo Wooldridge Division of TRW, the RAND Corporation, and other military, industrial, governmental, non-profit, management consultant, and academic organizations.

The National Highway Safety Act of 1966 requires each state to have a highway safety program, including comprehensive driver education and training programs.

In order to assure that the return on expanded efforts in driver education will be commensurate with the investment, the National Highway Safety Bureau contracted for studies to develop a concrete plan for evaluating the effectiveness of current or proposed driver education and training programs.

In accepting responsibility for one of those studies the Institute for Educational Development convened nine expert consultants representing relevant disciplines, who met monthly to develop a plan.

John L. Kennedy, Vice President of IED, was the chairman of the Study Group, and Robert L. Chapman of IED was the Project Director. Other members of the Study Group were Murray Blumenthal, Travelers Research Center; Dale E. Bussis, IED; Joseph L. Dionne, now with the California Test Bureau; Richard D. Ellis, State University of New York at Albany; Harry H. Harman, Educational Testing Service; Daniel W. Howland, Ohio State University; James L. Malfetti, Teachers College of Columbia University; Leonard Raymond, Mobil Research and Development Corporation; and Harold M. Schroder, Princeton University. William E. Tarrants of the National Highway Safety Bureau was an *ex officio* member of the group; Paul B. Carpenter was the IED Staff Assistant.

The Study Group method is a technique of illuminating salient aspects of a problem and applying a repertoire of skills to its solution by bringing together in intimate interaction a variety of disciplines--in this case, educators, social and experimental psychologists, engineers, systems analysts, and statisticians. This report describes their activities in defining problems in evaluating driver preparation programs, identifying alternative evaluation plans, selecting a recommended plan, and developing a test instrument for measuring driver proficiency.

PROBLEMS IN EVALUATING DRIVER PREPARATION PROGRAMS

Improving traffic safety and traffic flow is a systems problem that requires improvements in the driving environment and in the vehicle, as well as in driver performance. In full realization of the need for the systems approach, we concentrated our attention upon one component of the total traffic system, the driver, and upon improving his proficiency.

To develop an appropriate evaluation plan requires that three distinct issues be faced. In discussing the background for our approach, I will take them up separately.

The first issue is: What are the driver performance variables that contribute to effective driving in the real world?

> We emphasize that effective driving includes both the avoidance of accidents and the facilitation of traffic flow. A driver must be able to cope with the situations he encounters; he must be aware of the limits of his own capabilities in relation to his vehicle and particular driving conditions, and he should operate within those limits without impeding traffic flow. In addition, some emergencies do arise from vehicle malfunctions, from unexpected hazards in the driving environment, and from the behavior of other motorists. A driver should have some ability to cope with such emergencies if he is to avoid accidents. We consider that driver performance variables need to encompass not only behind-the-wheel behaviors, but also management judgments about vehicles and their use, citizen wisdom in traffic safety matters, and indexes of individual maturity.
>
> In reviewing the research that has been done, we found that driver performance variables have not been derived

from nor validated against performance criteria in the real-world traffic system. The best that can be done at this time is to pool the judgment of experts, using what evidence is available, in constructing a systematic set of hypotheses about relevant variables and how to measure them.

The second issue is: To what extent and how can performance on these variables be influenced?

Learning theory suggests that an effective learning experience for increasing driver proficiency requires that a student be exposed to a range of real world driving conditions, have the time and opportunity to indulge in exploratory behavior and practice, and have achievement on performance variables reinforced.

Typically, the design of driver education and training programs falls short of this ideal. Programs operating within the restrictive schedule of secondary schools permit students only a few hours behind-the-wheel, in very protected driving conditions. Little opportunity is provided the student to explore the limits of his capabilities in relation to the vehicle and to a range of driving environments, or to assess the risks associated with hazardous conditions. Emphasis is upon the proper execution of basic maneuvers, conforming to traffic regulations, and being very careful, rather than facilitating traffic flow.
More importantly, so long as relevant performance variables have not been determined, proficiency in all its aspects cannot be recognized and reinforced--limiting the effect of that vital factor, reinforcement, in the learning process. For too long, an unnecessary burden has been placed on those responsible for driver preparation, forcing them to conduct programs in terms of performance variables they have to derive intuitively.

Further, driving proficiency must not only be initially acquired, but must also be maintained and updated. This process is substantially influenced by other reinforcing agents. Driver licensing and law enforcement practices, community driving "norms",and involvement in accidents do not provide appropriate reinforcement of driver preparation programs.

The third issue is: What interventions to influence driver proficiency are feasible?

We are convinced that an evaluation program must be directed at the generic questions of how, when, and where influences can be brought to bear on improving driver proficiency that will provide an appropriate return on investment in the effort. It may be that the positive effects of driver preparation programs are being negated by other influences on driving proficiency.

An evaluation program should not be aimed either at justifying increased emphasis on traffic safety in the educational enterprise or at discrediting current programs; it must stimulate innovations as well as trace their effects; it should reduce uncertainties about the driving task and driver preparation; it should also avoid disrupting program continuity in the short run. And because driver preparation must assume its appropriate priority among other means for improving traffic safety and traffic flow, an evaluation program must yield information to guide the setting of priorities.

The limitations of past evaluation studies are ample warning that evaluating the effects of driver preparation programs is a challenging task. Ways must be found for collecting a great deal of information for interpreting driving behavior data in consideration of the kind and amount of exposure to driving conditions and of other factors that complicate the evaluation process. But human behavior has been effectively studied empirically in quite complex environments, and many powerful experimental and statistical techniques have evolved. An effective evaluation program can be conducted if enough talent and support can be brought to bear on a well-conceived program.

ALTERNATIVE EVALUATION PLANS

We identified three alternative evaluation plans worthy of condideration:

Plan I: Evaluating Program Characteristics
This plan concerns the quality of the learning experience provided by the program and focuses on the program's "openness" and capacity to "grow."

Plan II: Evaluating Driver Proficiency
This plan employs a test of driver proficiency, derived by expert opinion from required real-world behavior, to determine program effectiveness.

Plan III: Validating Program Effectiveness
This plan utilizes a validated test of driver proficiency to examine a broad range of influences, and interventions, upon the acquisition and maintenance of driver proficiency over the long term.

Plans I and II employ the best available judgment in clarifying program objectives and improving the quality of the learning experience for immediate application to short term evaluation. Plan I emphasizes the "mean" and Plan II emphasizes the "ends" of the educational process.

Plan III is a strategy for systematically gathering empirical support for the need for and efficacy of innovations in driver education and training over the long term.

Each of the plans is described in more detail, beginning with Plan III.

Plan III: Validating Program Effectiveness

An evaluation plan that takes a fundamental approach to examining the effectiveness of driver education and training programs requires a three-stage process, as shown in Figure 1.

- Stage 1: Derive performance variables from criteria of driver behavior in the real world, using available evidence; obtain tests of driver proficiency that measure these characteristics.
- Stage 2: Validate these measures in the real world to establish a set of empirical, intermediate criteria by which driver preparation program graduates can be judged.
- Stage 3: Examine driver education and training programs themselves to see how well their graduates score on the validated test of driver proficiency.

Stage 1:

We have already accomplished part of Stage 1 by developing a draft of a driver proficiency test, to be described later in this report. But preliminary data must be collected to refine the test before it is ready for use in Stage 2.

Stage 2:

The question to be answered in validating the tests of driver proficiency is whether the instrument discriminates between drivers that cope more successfully in the real world and those that perform less well. We maintain that, despite its historical problems, the concept of criterion groups of "good" and "poor" drivers can be employed in validating performance variables _if it is appropriately defined and used._ Criterion groups representing individuals of both extremes of the continuums of performance variables must be identified in terms of multiple criteria--not just in terms of single factors such as number of accidents, which in isolation have proved to be quite unreliable.

Because test validation depends so critically upon isolating groups of "good" and "poor" drivers, much effort is warranted in selecting these groups. We propose that the candidates for the criterion groups be found by obtaining nominations for the good and bad driver classifications, by reviewing official records of the previous five years, and by seeking the cooperation of police departments in identifying critical incidents (and the driver involved) in traffic patterns. These candidates should then be interviewed to obtain corrected accident and violation records, the extent and kind of driving exposure, and biographical information (for proper interpretation of analysis results). By combining all these data, criterion groups could be selected.

As an additional consideration in the validation, it is proposed that two communities be used, one urban and the other rural, to be sure that performance variables relevant to these distinct driving environments are found.

In order to collect sufficient data for the validation process, 200 "good" drivers and 200 "poor" drivers are needed. Half of each criterion group would come from the urban community, half from the rural. The driver proficiency test would be administered to these drivers and the data analyzed to discover which of the subscores on the instrument discriminate between the two criterion groups.

Stage 3:

Driver education and training programs themselves are evaluated in a cross-sectional study, a longitudinal study, and broad-scale studies.

The objective of the cross-sectional study is to determine whether different driver education and training programs

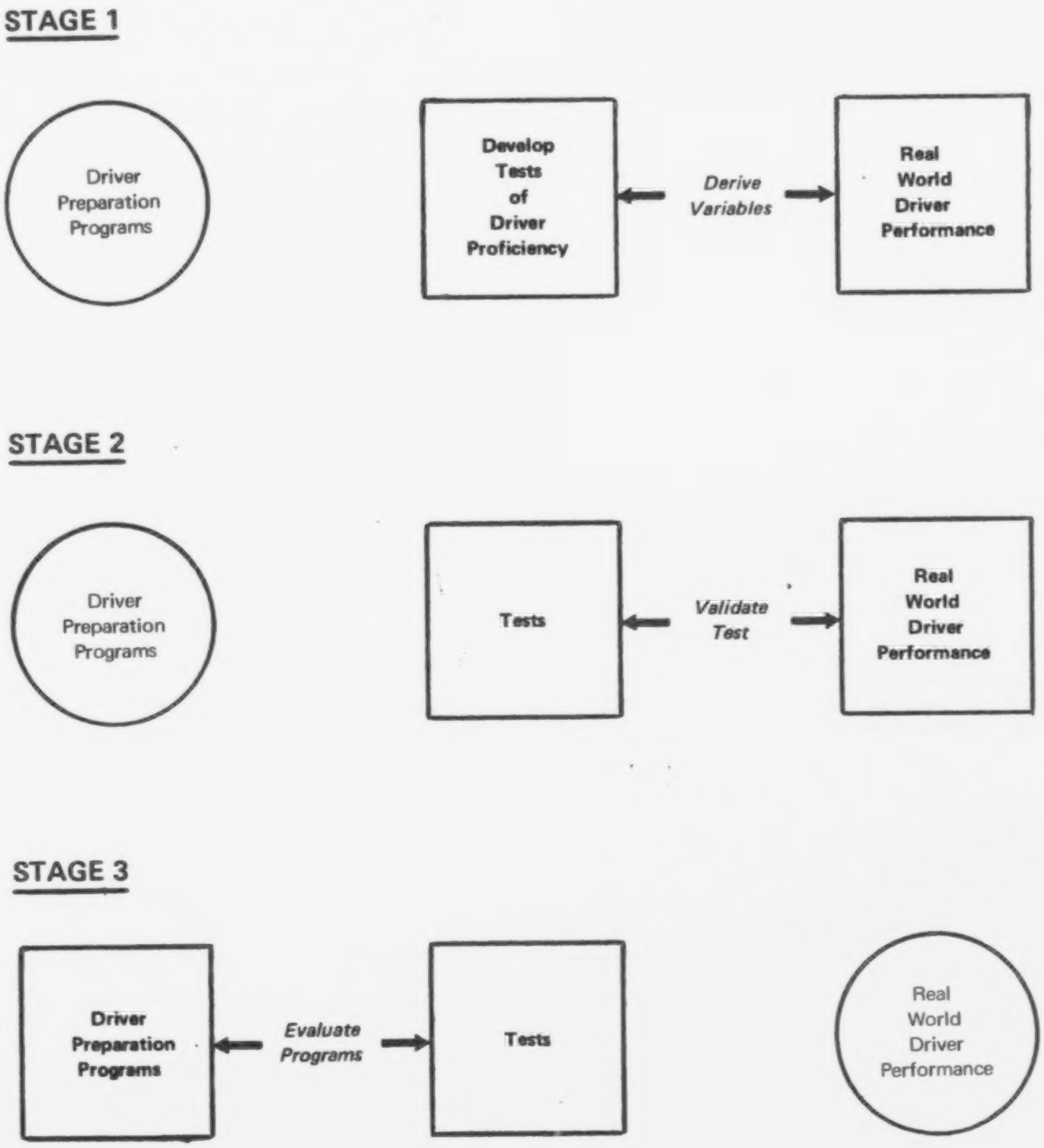
STAGE 1
Driver Preparation Programs
Develop Tests of Driver Proficiency
Derive Variables
Real World Driver Performance
STAGE 2
Driver Preparation Programs
Tests
Validate Test
Real World Driver Performance
STAGE 3
Driver Preparation Programs
Evaluate Programs
Tests
Real World Driver Performance

Fig. 1. Three stages of validating program effectiveness.

produce any differences in scores on the driver proficiency test. To accentuate this question, one group of newly licensed drivers is included who have had no driver preparation programs.

We propose that the validated test instrument be administered to 400 graduates of each of three selected programs, and to 400 newly licensed drivers without formal preparation (a total of 1600 new drivers in all).

The longitudinal study would examine the very important question of whether the good effects obtained from driver preparation programs persist over time. A two-pronged effort is advocated: first, that the instrument be re-administered at one, three, and six year intervals following completion of the driver course; second, that real-world measures of driving performance be obtained during this period.

Four groups of 400 graduates of different driver preparation programs, and a control group of 400 new drivers without formal training, are required, for a total of 2000 drivers in all.

The broad-scale evaluation studies should be aimed at the monitoring of marginal programs, at standard programs being newly implemented in states previously without them, and at experimental programs.

Actually, Plan III might better be termed a strategy than a plan because it is dynamic and has intervention points at which decisions are required--to revise the tests, data collection procedures, or analysis methods or, in fact, to terminate the investigation because encouraging results have not been obtained.

Plan II: Evaluating Driver Proficiency

This plan employs tests of driver proficiency, prior to their validation, to examine the extent to which driver preparation programs influence behavior in the direction of driver proficiency. It can be applied to all types of programs--those in secondary and commercial schools and those for adult retraining and teacher preparation.

Comparisons of the effectiveness of different types of driver preparation programs could be made in the short term by testing graduates of the respective programs (and a control group with no formal training). Conclusions about the value of the respective programs would have to be tentative until the validity of the test instrument was demonstrated.

Plan I: Evaluating Program Characteristics

The value of this evaluation plan is predicated upon the immediate benefits to be realized by encouraging interaction among all the elements of the driver preparation system. Plan I focuses upon the quality of the learning experience provided by the driver education and training program with emphasis upon the program's "openness" and ability to make use of "feedback" about its effectiveness. It is more directly applicable to the evaluation of driver preparation programs in secondary schools.

We propose that programs be rated by a combination of their scores on two scales:

- The Program Element Scale. Scores are based on the degree of conformity to criteria believed to be minimally required for an effective program.
- The "Openness" Scale. Scores are based on a program's ability to generate and incorporate new knowledge and to benefit from experience. Provisions for external review, for feedback, for innovation, for research, and for the use of research findings are criteria of "openness."

The "openness" scale, and the particular use of the program element scale, distinguish this evaluation plan from traditional accreditation procedures.

RECOMMENDED EVALUATION PLAN

As the result of comparing the benefits and shortcomings, and the short and long term implications, of each of the three alternative plans, the Study Group concluded that the three plans are not independent approaches to evaluating driver preparation programs but are complementary, iterative phases of an overall, integrated evaluation plan.

Plan I focuses on the "means" and Plan II upon the "ends" in the short term; the results from Plan III can be used to modify Plans I and II in the longer range. With the empirical support provided by Plan III, Plan I can be used to evaluate programs of a particular type while Plan II can have a complementary use in comparing effectiveness among types of driver preparation programs.

The Study Group, therefore, recommends integrating Plans I, II, and III into an iterative, progressively more pertinent evaluation of driver preparation programs. The next figure shows how these plans relate to each other over a five- to ten-year period.

Separately, or in combination, Plans I and II cannot but help to influence the quality of the learning experience for the student in the direction of becoming more relevant to proficiency on driver performance variables. For example, their use would expose these shortcomings in current practices:

- Lack of clear cut program objectives
- Lack of focus upon the desired behavior changes
- Lack of feedback to programs on how their graduates fare in the real world
- Lack of awareness of useful research findings
- Lack of openness to change and improvement
- Lack of emphasis upon behind-the-wheel experience, especially in a less protected environment

Methods of short term evaluation must be developed and employed. Plans I and II serve this purpose, but they also represent means of transition towards the acceptance and use of empirical findings such as are obtained from Plan III.

Plan III is a technically sound design for establishing empirical support for the contents of Plans I and II. Unless the initial forms of Plans I and II are recognized as preliminary steps towards an adequate evaluation of driver preparation programs, the benefits to be realized from their use in the short term may be negated by the failure to seek revisions in them.

TEST OF DRIVER PROFICIENCY

The need for a test instrument to measure individual driver proficiency is integral to both Plans II and III. In order to determine what driver performance variables might be

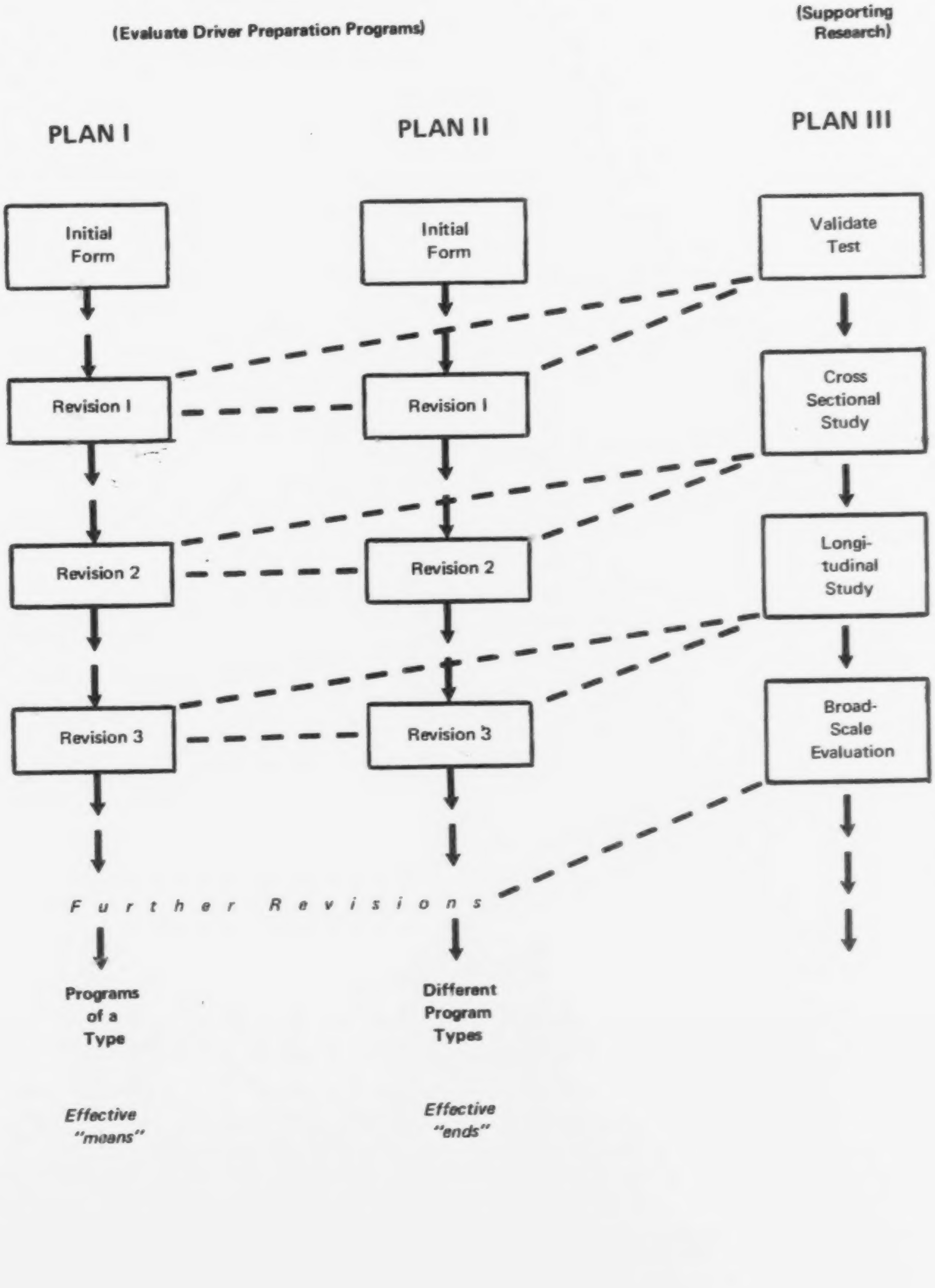
(Evaluate Driver Preparation Programs)
(Supporting Research)
PLAN I
PLAN II
PLAN III
Initial Form
Initial Form
Validate Test
Revision I
Revision I
Cross Sectional Study
Revision 2
Revision 2
Longi-tudinal Study
Revision 3
Revision 3
Broad-Scale Evaluation
Further Revisions
Programs of a Type
Different Program Types
Effective "means"
Effective "ends"

Fig. 2. Integration of Plans I, II, and III.

relevant, we chose to pool expert judgments in a systematic way, using available evidence to define content areas. The research literature was searched for those variables with a demonstrable relation to traffic safety and traffic flow; this list was then made comprehensive by including the most credible hypotheses on which we could agree.

We would prefer to measure performance rather than paper-and-pencil behavior whenever possible. Although emphasis is on the integrated "whole" driver, content variables can be readily classified into driver knowledge, driver attitudes, and driver performance. Measures of knowledge and attitude are included in the test instrument because these components interact with skill in establishing driver behavior.

We found that for a variety of reasons the existing tests in the areas of knowledge, attitude, and performance were not satisfactory and that tests would have to be developed if the proposed evaluation plans were to be implemented effectively.

The Driver Information Test provides subscores on these fourteen aspects of driver knowledge: alcohol, drugs, vehicle packaging, vehicle condition, highway environment, speed-force relations , emergency responses, traffic flow, basic skills, hazard perception, response to hazards, commitment to safety, driver licensing, and trip planning.

The Driver Attitude Test has four parts. The first of these measures both the realism and directionality of expectations about traffic safety. The second measures the internalization of safety standards. The third utilizes the measures obtained from the Stable and Impulsive subscales of the Thurstone Temperament Schedule. The fourth measures attitudes about risk.

The Performance Test is divided into three parts, each approximately 30 minutes long, to be given in sequential order on separate occasions. Part A includes static testing as well as the measurement of basic skills. The test starts at a test facility and progresses to live traffic as the testee demonstrates the necessary competence. Part B measures the testee's perception of and avoidance of hazards, and his response to emergencies. This test is conducted at a test facility, and includes testing on a simulator. Part C is concerned with advanced driving skills, smoothness of vehicular control, and facilitation of traffic flow; it is conducted on a freeway or similar roadway. Parts A and C are conducted over fixed routes to hold highway characteristics and required driving maneuvers as constant as possible. Instrumented data is collected throughout the route; additional checklists are designed so that a rater can sequentially attend to driver response to specific situations.

We believe that we have designed a test instrument that represents improvement over tests that are available--in terms of comprehensiveness and of techniques for better getting at qualities of interest.

CONCLUSIONS

The IED Study Group is well aware of the technical challenge involved in evaluating driver preparation programs:

- Difficulties in finding hard data about effective driving performance in the real world
- Complexities of the driving task and how to identify the elements of it
- Relations between driver preparation on one hand and other institutional influences upon driver behavior
- Controversy about the usefulness of intermediate variables as surrogates for real world driving performance
- Practical difficulties in making changes in existing programs

We interpreted our task as requiring a very specific action plan--one that included substantive hypotheses about effective driving behavior rather than mere reiteration of the need for further research. We find these recommendations imperative:

> First, that because improving traffic safety and traffic flow is a systems problem, the National Highway Safety Bureau must guide its support of component studies by cost/effectiveness decisions based on systems analysis of the interactions among components that affect the achievement of system goals. In this connection, complementary programs in the areas of driver licensing, law enforcement, and driver preparation are required if driver performance is to be improved.

Second, that Plans I, II, and III, as outlined by the IED Study Group, be implemented concurrently to provide complementary evaluation techniques for updating driver preparation programs that can be iteratively and progressively improved on the basis on adequate empirical evidence.

We believe that substantial inroads on this problem can be made for an expenditure of $3 million over a decade, a fraction of the amount that may be spent on driver preparation programs each year with little assurance that the return justifies the investment.

Only by an evaluation program that includes the technically sound design of Plan III can traffic safety be removed from the realm of folklore and can the necessary scientific and technical knowledge be brought to bear on the problem.

RESEARCH IN DRIVER EDUCATION

John J. Conger
Vice President for Medical Affairs
University of Colorado
Denver

Dr. Conger received a B.A. degree magna cum laude from Amherst College in 1943, and after wartime service with the U.S. Navy aboard destroyer escorts, he received his M.S. and Ph.D. degrees in psychology from Yale University, graduating in 1949.

After teaching in the graduate and medical schools at Indiana University, he joined the faculty of the University of Colorado School of Medicine in 1953 as professor and head of the Division of Clinical Psychology, Department of Psychiatry. He served as Associate Dean of the Medical School from 1961 to 1963, and as Dean from 1963 to 1968. He was also appointed as Vice President for Medical Affairs of the University in 1963, a position which he still holds.

Dr. Conger is a member of the Policy and Planning Board, American Psychological Association; the National Motor Vehicle Safety Advisory Council; and the National Advisory Mental Health Council. He served previously as Chairman of the Research Committee of the Advisory Council of the President's Committee on Traffic Safety; and has been a member of the accident research study section of the National Institutes of Health and, during the past year, the Secretary's Advisory Committee on Traffic Safety, Department of Health, Education, and Welfare.

Among his books are the bestselling textbook, *Child Development and Personality*, and *Personality, Social Class, and Delinquency*. He is the author of numerous scientific articles in the fields of child and adolescent development, accident research, and medical education, and is a member of the editorial board of the *Journal of Medical Education* and the *Traffic Safety Research Review*.

Mounting national concern with the rising toll of death and disability on our highways, as reflected in recent Federal legislation, has brought all elements of the highway safety problem under increasingly sharp scrutiny - the highway, the vehicle, and the driver himself. In the process, dormant controversies regarding the effectiveness of driver education have been reawakened, and there has been a rapid resurgence of research interest in this field.

The dimensions of the problem can be stated very simply. In 1966-67, we were providing some sort of driver education for about two million high school students in this country, or about 54% of all those eligible, at a total annual operating cost of approximately $142 million. As a result of Federal, state, and private incentives, the percentage of students involved is continuing to expand rapidly, and it appears likely that our national investment in high school driver education may exceed 1.3 billion dollars over the next five years. Commercial and special purpose programs are estimated to involve another two million adolescents and adults a year, at an annual operating cost of $225 million.

Obviously, the nation is involved in a major effort in the field of driver education. The question being asked is how effective is this investment, both in and of itself and in relation to other urgent claims upon limited resources? Or, couched in terms of currently popular Washingtonese, what is the cost-benefit ratio?

It appears clear that we cannot hope to evaluate the effectivennes of any experimental procedure without knowing first what the goals of the procedure are, or, stated in more scientific terms, what the relevant criteria are. Thus, in the case of driver education, we need to know if our goal is to provide entrance-level driving skills in an efficient and broadly available fashion; to inform future citizens regarding the national transportation and safety problems they will be confronted with in the future; to reduce the mounting toll of accidents and violations over the near, itermediate, or longer term; or some combination of these or other aims.

It is not my task here to attempt to prescribe what our goal or goals - our criteria - should be, although clearly this should be an urgent concern for all of us. The historical fact, however, is that the primary criteria for effectiveness which have been employed to date involve reductions in the incidence of accidents and violations, and, in particular, incidence of driver responsible accidents over varying periods of time.

One might wish to argue about whether these are or are not the most realistic or appropriate criteria for evaluating the effectiveness of driver education, but they have unquestionably been the most widely employed in most research in this field, and for a very simple reason. Historically, the overriding justification for driver education offered by driver educators themselves, in their efforts to convince the public and the educational system of the curricular importance of this subject, was the need to reduce injury and death on our highways, and the presumed effectiveness of driver education in helping to achieve this goal.

In the early days of driver education programs, this argument was based largely on "common sense," or as we say in the trade, "construct validity." Somewhat more recently, however, a substantial number of studies were conducted which appeared to reinforce "common sense" with solid statistical support. In 1964, Ross McFarland (6) summarized a number of these studies, involving a total of 1226 accidents and 300,536 driver months (Figure 1). In general, these studies appeared to indicate that the accident rates of trained drivers were only about half as high as those of untrained drivers, at least for the first few years of driving. Similar ratios were obtained for both males and

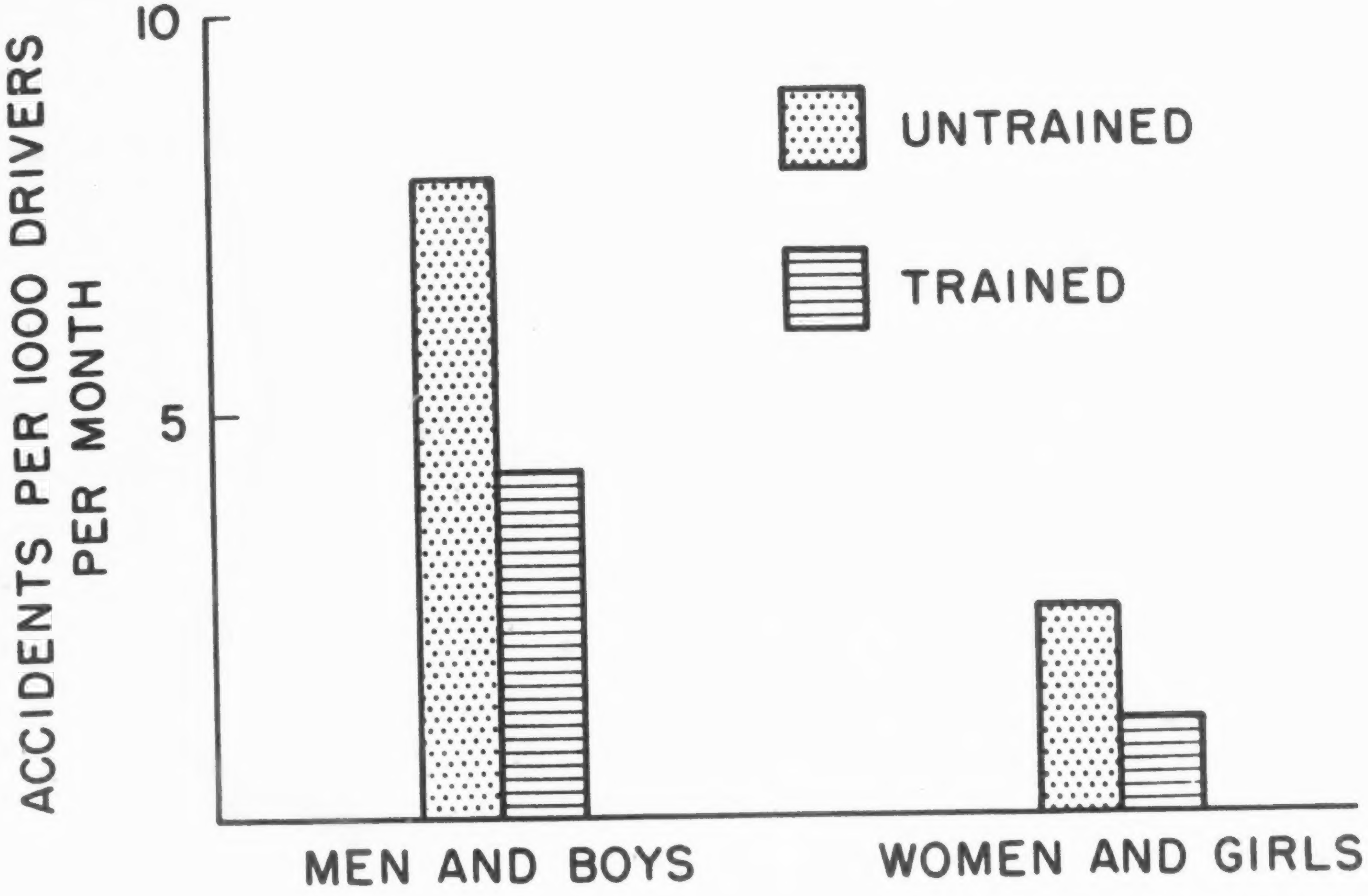

Fig. 1. The safety record of trained drivers compared with that of untrained, based on 1,226 accidents during an exposure of 300,536 driver-months.

females, although the overall incidence of accidents for females was, of course, much smaller than that for males. Many of these reports also showed fewer violations of traffic regulations by trained drivers, and indicated that classroom instruction supplemented by behind-the-wheel training was more effective than classroom instruction alone.

At first blush, such findings appeared to provide clear evidence of the value of driver education in reducing accidents and violations, and they certainly appeared to place driver education alongside motherhood and apple pie in terms of its unquestioned goodness. In fact, in 1961 after reviewing the results of earlier studies, the National Education Association in a booklet entitled "Summary of Results of Studies Evaluating Driver Education" was led to conclude:

> *The necessity for further large-scale investigating of the records of trained and untrained drivers on the same level of investigation is not indicated by this report. The evidence presented herein well establishes the merits of driver education.*

Unfortunately, however, it appears that doubting Thomases are always with us, and that even those who themselves are not without sin remain ready to cast the first stone. Just as there continue to be devil's advocates who insist upon pointing out the joys of sin, who view motherhood as the source of the population crisis, or who wonder aloud about whether apple pie may not be carcinogenic, there were those who remained skeptical, despite the apparent finality of the NEA's encyclical, about the effectiveness of a limited course in driver education in apparently reducing accidents and violations so dramatically. As a result, a number of them insisted on looking at the data and the experimental controls employed a bit more closely.

In an infamous study conducted at the University of Colorado School of Medicine by Rainey, Walsmith, and myself (9), the personality characteristics of students voluntarily electing driver education were compared with those of students electing not to take it, on the not unreasonable assumption, concurred in by some of my colleagues in driver education, that in a free-choice situation adolescents with certain kinds of personality characteristics might be more likely both to elect driver education and to be motivated to drive safely. If so, then the presumed causal relationship between driver education and reduced accidents and violations might, in fact, be due in part at least to the pre-driving personality characteristics of these youths, rather than solely to the effects of driver education itself.

The findings of this study appeared to lend some credence to the hypothesis. After controlling for the potentially distorting effects on any results of such factors as socioeconomic status, schools attended, access to cars, and the like, we found that youths wanting driver education differed significantly on a variety of personality measures from their more indifferent peers who did not want it. (Table 1). Thus, on the Guiford-Zimmerman Temperament Survey, non-driver education subjects revealed a significantly higher general activity level; more ascendant, assertive behavior; more interest in social participation; and stronger masculine interests. In terms of values, as measured by the Allport-Vernon-Lindzey Study of Values, driver education subjects showed significantly higher esthetic values. On the California Mental Health Analysis, both groups of students fell in the normal range, but driver education subjects tended to feel less blandly confident of their personal inadequacy, more concerned about possible or imagined presence of physical defects, and less oblivious to "nervous manifestations." In brief, driver education subjects appeared to be somewhat more introspective, more sensitive; and more esthetic in their interests, and to feel somewhat less self-assured and more concerned with their physical and mental health. In contrast, non-driver education subjects tended to be more active generally, more ascendant and assertive, and more oriented toward gregarious, out-going, masculine social interests.

In a somewhat similar vein, William Asher studied a representative national sample of high school seniors, using data from Project TALENT (2). On a wide variety of measures available from this survey he compared students who had and who had not taken driver training when it was available. In brief summary, he found that driver education students, in contrast to their non-driver education peers, scored higher in knowledge of literature, music, social studies, mathematics, and biological sciences. They also scored higher in such measures of intelligence as abstract reasoning, reading comprehension, and mathematical ability. They were more likely to have taken foreign language courses, and to have plans for going on to college. In their personal lives, driver education subjects were more likely to have started earning money at a younger age and were likely to have fewer dates per week.

Thus, it appeared that preexisting personality characteristics might serve as a selective factor in driver education,

TABLE I

Personality Test Measures Significantly Discriminating Driver Education and non-Driver Education Groups[3]

Test	Driver Education (N=52)		Non-driver Education (N=104)		Level of Significance (below .05)
	M	SD	M	SD	
Guilford-Zimmerman Temperament Survey					
General Activity	16.25	4.40	18.72	5.00	$p < .005$
Ascendance	13.88	4.32	16.78	4.93	$p < .001$
Social Interest	18.12	5.58	21.03	5.95	$p < .005$
Masculinity	19.88	4.20	21.34	3.95	$p < .05$
Allport-Vernon-Lindzey Study of Values (Mod.)					
Aesthetic	35.50	6.27	32.33	6.22	$p < .005$
California Mental Health Analysis					
Feelings of Inadequacy	13.33	4.77	15.38	3.30	$p < .005$
Physical Defects	18.02	2.96	19.17	1.45	$p < .005$
Nervous Manifestations	15.56	3.56	17.06	2.27	$p < .005$

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[3] All comparisons made by Analyses of Variance techniques with 1 and 146 degrees of freedom used to determine the level of significance.

and thus should be controlled in one fashion or another in studies of driver-education effectiveness. Other studies have indicated that accident and violation rates may be influenced by exposure (miles driven per year under various driving conditions), age, sex, socioeconomic status, education, intelligence, and the like (3, 5, 7). Consequently, these also should be controlled in any definitive study, either by random assignment to experimental and control groups, or, if this is not possible, by matching or covariance statistical techniques. Furthermore, since accidents and violations constitute elusive, not always reliable, and relatively infrequent criterion measures, these measures themselves need to be well defined and measured, and we need adequate numbers of cases available over a sufficiently long period of time.

When earlier studies were reexamined for their degree of adherence to the need for controlling for the potential effects of such variables to avoid distorting the results, they were rather consistently found lacking, and the results of more recent, better controlled studies cast considerable doubt on the validity of these earlier findings. Most notably lacking in earlier studies were controls for exposure. And yet we now know that both driver education subjects tend to driver fewer miles and that mileage is correlated with accidents and exposure. For example, in a Marine Corps study, McGuire (7) found that accident- and violation-free subjects averaged only half as many miles driven in a two-year period as those who had at least one accident associated with a moving violation. McGuire and Kersh, and our own investigations of high school students, revealed similar but not as extreme findings.

What do we find when we examine the results of more recent, better controlled studies? In one of the more extensive investigations, 3,878 males and 2,786 females in the age range 16-19 were involved in a state-wide investigation in California by Coppin, Ferdun, and Peck (4). The subjects were divided into three groups: took driver training (about 65%); did not take driver training (28.8%); and driver training not offered (6.2%). The average numbers of accidents and violations sustained over a one-year period were then computed for each group. The results for accidents for both males and females (Figure 2) show that no significant differences for either sex were obtained between those who took and those who did not take driver education. In the case of violations, however, (Figure 3) there was a significant difference in favor of trained drivers ($p<.01$). Thus it would appear initially, at least in this California study, that driver education produced fewer violations, but not fewer accidents.

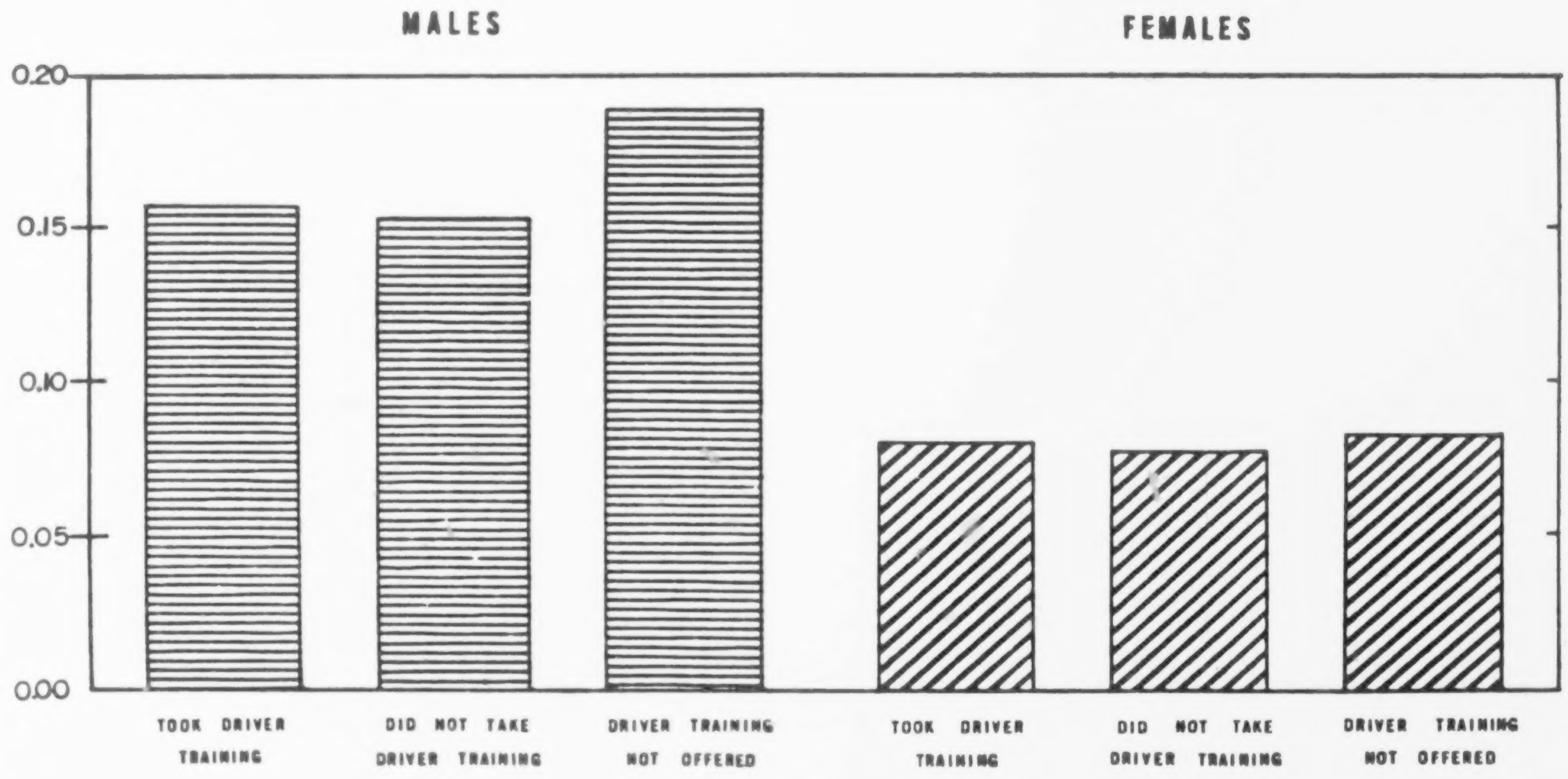

Fig. 2. Average (mean) number of accidents for trained and untrained drivers by sex (one year record).

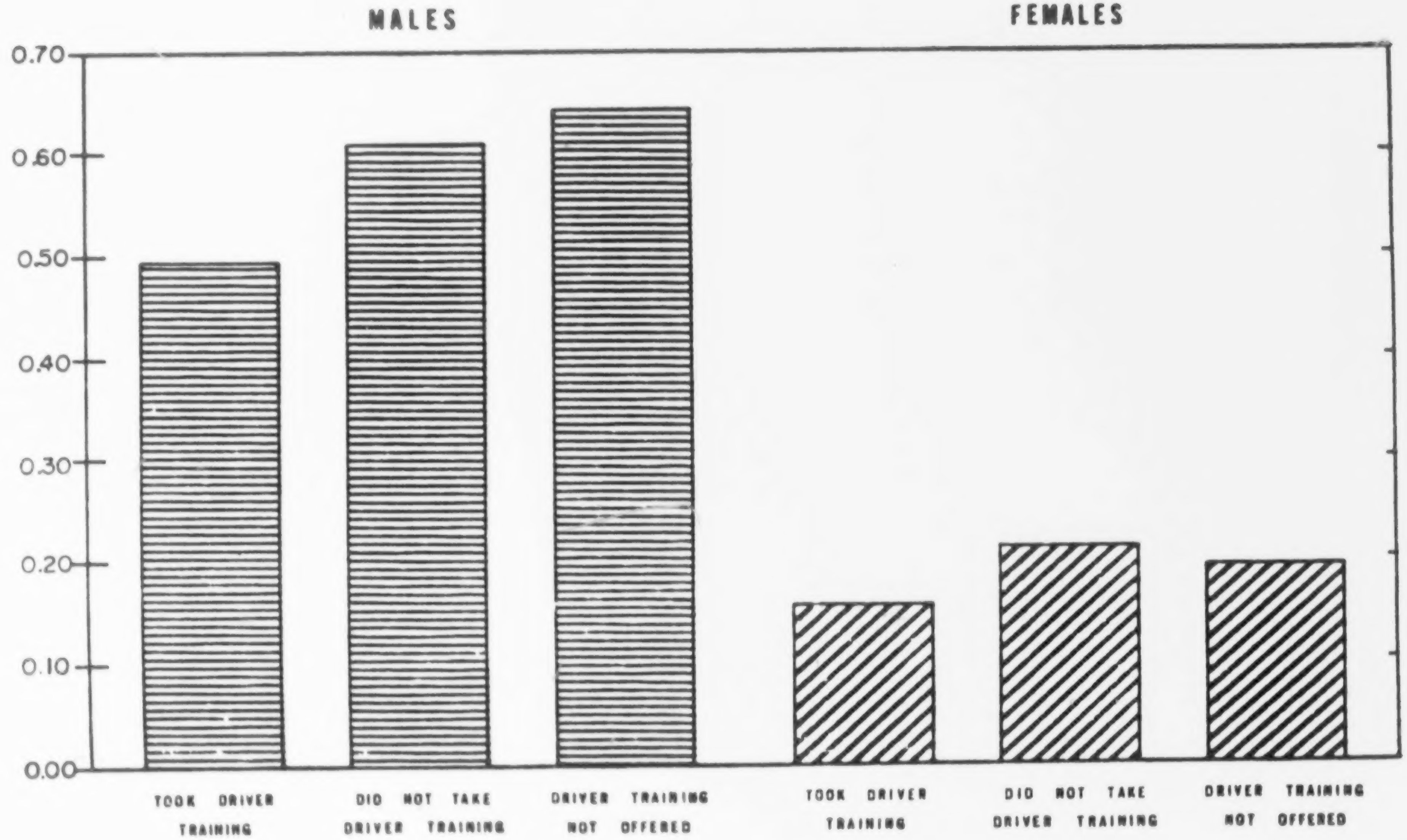

Fig. 3. Average (mean) number of violations for trained and untrained drivers by sex (one year record).

But what about the potentially distorting effect of exposure, which we have previously noted? If the trained group had driven a significantly greater number of miles, any failure to find a lower accident frequency for the trained group could possibly be explained by the greater exposure of this group. What do we actually find? We found that trained males actually drive significantly fewer miles than the untrained males. For females, the small differences in mean miles driven are not statistically significant. Thus, as Coppin notes, if anything, the trained male group should have been favored in any driving record comparison and the trained females unaffected. This fact renders the superior violation record of the trained males somewhat uncertain. On the other hand, the failure to find an accident reduction for the trained group appears even more conclusive (Table 2).

This study also ruled out, through appropriate statistical analysis, any bias due to possible age differences between groups as well as exposure. It did not, however, take into account the possible influence of such additional factors as socioeconomic status, intelligence, educational background, and the like. Such an attempt was recently made in a study by Wilbur Miller, Robert Rainey and myself (3). Three groups of male Denver High School students served as subjects. All students were at the same school grade level, and the mean ages of students in all three groups were comparable. The first group consisted of 108 students who had elected formal driver education, including behind-the-wheel training, and who had completed it (Group I). Group II consisted of 195 students who had indicated in a survey that they wanted to take driver education, but who for one reason or another had been unable to do so (insufficient facilities, conflicts with other course work, etc.). Since the assignment of subjects to Groups I and II was not done randomly by the investigators but resulted from the student's life situation, it might be suspected that members of the two groups would differ in a number of important characteristics, as indeed proved to be the case. Group II was made up of 314 students who did not wish to take driver education training, and consequently did not take it.

Our basic reasoning was that, if Group I and II, both of which wanted to take driver education, performed similarly and significantly better than Group III which did not want to take it, it would indicate that the subject's prior personality and attitudes were of primary importance in determining future driving behavior. If, on the other hand, Groups II and III, neither of which actually took formal driver training, performed similarly or significantly worse than Group I which did take it, it would suggest that the driver training experience itself was of dominant importance.

TABLE 2

Annual Mileage--1963 by Driver Training Status

Driver training status	Mean annual mileage 1963	
	Males	**Females**
Took and passed	9,489	4,596
Did not take	10,751	4,394
Could not take	10,641	4,971

All subjects in the three groups were initially compared with respect to exposure, socioeconomic status, intelligence, accidents, points, and violations over a four-year period. It was found that Group I (those electing and taking driver education training) scored most favorably on all three criterion measures. The results showed that statistically significant mean differences were obtained for points and violations--with Group I scoring considerably lower than either Group II or Group III (Table 3). In the case for which the subject is *judged responsible* differences were not large enough to achieve statistical significance. Despite differences in method, these results appear to be in general agreement with those of Coppin, Ferdun, and Peck in their much larger California study.

Simply on the basis of our findings, it might appear that electing and taking driver education significantly improved the young male's overall record in the early years of driving, at least insofar as points and moving violations are concerned. However, a closer examination of the three groups revealed that they differed in their composition. Subjects in Group I had the highest average IQ of the three groups, tied with Group III for most favorable socioeconomic status, and had by far the lowest driving exposure. This, of course, raised the possibility that the better driving records of Group I subjects might have been determined, at least in part, by reduced exposure to situations in which violations might occur and by more favorable socioeconomic and IQ status. Again, these findings appear comparable to those of Coppin, Ferdun, and Peck indicating that male students taking and passing driver training programs drove significantly fewer miles per year than students who did not take driver training. Also, in a related vein, the study by Asher already described, and a recent study of New York students both indicate that scholastic standing is related inversely to accident and violations records (1).

In order to control for the possible effects of non-driver education variables, subjects in each of these three new groups were individually matched as closely as possible across groups on exposure, socioeconomic status, and IQ. The data were then analyzed again. What was the result? Table 4 indicates that the significant differences on points and violations originally found are eliminated. While Group I still has the lowest absolute number of points and violations, neither of these differences any longer approaches statistical significance. However, previously insignificant mean differences in responsible accidents now become significant at the .05 level, with Group I manifesting fewer accidents than Groups II or III.

TABLE 3

Mean Scores of Unmatched Driver Education and non-Driver Education Groups on Intelligence, Driving Exposure, Socioeconomic Status, Responsible Accidents, Points, and Violations

	Mean Scores				
	Group I (N=108)	Group II (N=195)	Group III (N=314)	F Ratio	Significance Level (if <.05)
Exposure (miles driven per year, in thousands)	5.58	7.00	7.26	6.36	.005
IQ (Otis)	106.1	102.1	105.2	5.25	.01
Socioeconomic status (Percent dilapidation)	11.7	18.5	11.7	7.99	.001
Responsible accidents	.20	.31	.27	1.89*	
Points	4.84	7.68	7.97	5.69	.005
Violations	1.38	2.24	2.27	5.69	.005

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*Chi Square, with 2 df.

TABLE 4

Mean Scores of Matched Driver Education and non-Driver Education Groups on Intelligence, Driving Exposure, Socioeconomic Status, Responsible Accidents, Points, and Violations

	Mean Scores				
	Group I (N=40)	Group II (N=40)	Group III (N=40)	F Ratio	Significance Level (if <.05)
Exposure (miles driven per year, in thousands)	4.74	4.79	4.74	.00	
IQ (Otis)	104.1	104.0	104.1	.01	
Socioeconomic status (Percent dilapidation)	11.0	10.7	9.7	.41	
Responsible accidents	.08	.33	.20	6.32*	.05
Points	3.95	5.05	6.38	1.16	
Violations	1.05	1.50	1.65	1.00	

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*Chi Square, with 2 df.

Lest I be drummed out of this gathering for statistical nihilism, I would like to point out that, as in this instance, improved experimental controls can apparently sometimes rescue a presumed effect rather than destroy it. Thus, while we found no significant differences in accident rates between our three groups before we controlled for exposure, IQ, and socioeconomic status, such an effect did emerge after instituting such controls. However, the question still remains whether our findings would continue to hold up with larger groups of subjects, with subjects receiving other kinds of driver education, with girls, and so on.

A recent study by McGuire and his associates would appear to temper our optimism (7). In a Mississippi study, he compared 158 students for whom formal driver education was the main method by which they had learned to drive, with a series of matched samples of subjects who reported that they had no formal instruction in learning to drive, but had either taught themselves, been taught by peers, friends, or parents, or a combination. In the case of accidents, subjects were matched on sex, age, occupation, type of license applied for, and percentage of local driving. (It had been previously determined that these variables accounted for most of the relationship between various biographical factors and accidents.) After matching on these variables, no significant differences between the two groups were found in numbers of responsible accidents. In one comparison involving a total of 290 drivers, 56 in the trained group had one or more accidents over a two-year period, as compared with 58 in the untrained group. In a second sample, the comparable numbers of accident-individuals were 52 and 46, respectively. Thus, when matched samples were employed, there were no significant differences in accident rates between the trained and untrained groups.

When subjects in the two groups were compared on violations prior to appropriate matching for relevant variables, results similar to Coppin's and to those from our own unmatched groups were obtained: driver education subjects had significantly fewer violations. After matching, however, these differences disappeared.

Finally, a word might be said about a study by Mr. Norman M. Thomas (12). Mr. Thomas, a statistician at the Boston Edison Company, became concerned about whether driver education actually lowered the accident rate. He decided to compute for the period 1955-65 the number of automobiles entering the Massachusetts population that had been qualified by the Insurance Commission to be operated by drivers under twenty-five who had received *approved driver* *training*. He plotted on the same graph the insurance claim frequency for all vehicles listed as being insured with drivers under the age of twenty-five for the same decade. His assumption was that as the trained driving population gradually included a significantly larger percentage of the total *under 25* vehicle population a similar, inverse change should take place on the claim frequency. In other words, he reasoned, if driver education tends to reduce accidents, then fewer accident claims should be filed as the percentage of trained drivers increases.

His results showed that there is no apparent relationship between claim frequency and the number of trained drivers in the State of Massachusetts (Figure 4). As McGuire notes, this type of study allows only an inference to be made, as opposed to an experimental design from which cause-and-effect relationships may be determined. However, *the directness of the logic and the simplicity of presentation is striking and certainly offers ample evidence for closer examination of the idea that driver education influences accident frequency* (7).

Where does all this leave us? If arguments in favor of investing very substatial and scarce safety resources on driver education are to continue to be based on presumed evidence of its value in reducing accidents, or even violations (which incidentally only correlate about .10 to .20 with accidents), then one is leaning on a shaky reed indeed. If driver education, of some sort, or with some subjects, does indeed significantly reduce susceptibility to some or all kinds of accidents, the weight of the evidence suggests that this remains to be demonstrated.

It may well be that some kinds of driver education exist, or could be devised, that are capable of reducing accident susceptibility for some kinds of subjects under certain conditions. If this should be our hypothesis, we ought to get on with the job of investigating more systematically the nature of the driving task itself, the extent to which current driver education courses involve training appropriate to the demands of the driving task, and the extent to which new approaches might do the job better. Despite the fact that many present courses can be categorized in terms of their degree of conformity to the so-called *30-and-60* format, it seems probable that many of these courses differ from one another in more subtle and substantive ways. One of the inputs in any analysis of the driving task might concentrate on relatively rare, but vitally important responses to emergency situations.

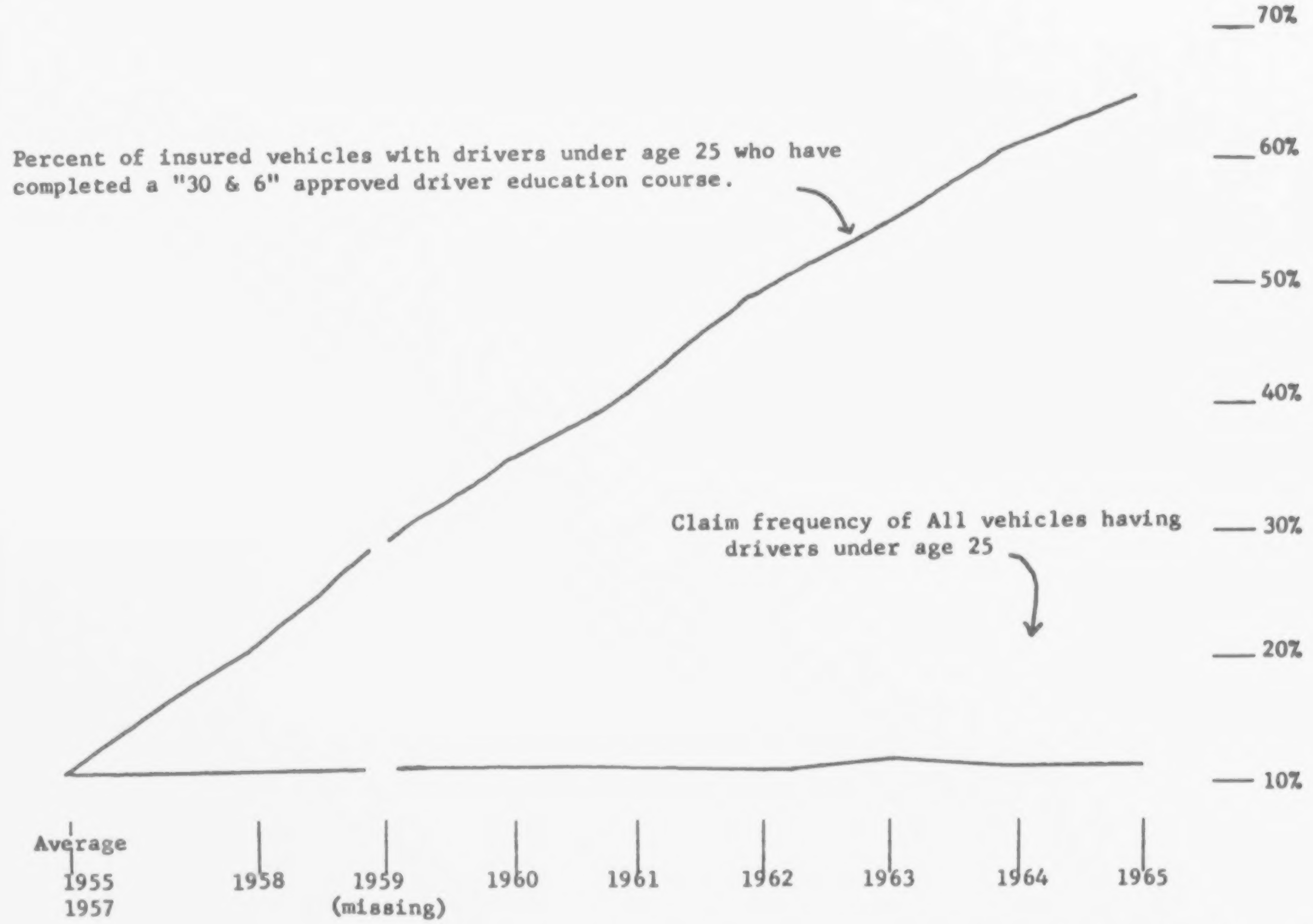

Fig. 4. Relationship between insurance claim rate and increase in number of driver education graduates--State of Massachusetts, 1955-1965.

Further, it may well be that all students do not have the same driver education needs - either in terms of attitudes, knowledge, or skills. There is some evidence that different kinds of subjects may, at least relatively, be likely to be involved in different kinds of accidents. I am convinced that there is room for a great deal more imagination in the development of techniques for approaching the education - both in terms of skills and attitudes - of, for example, adolescent boys, taking into account the many psychological variables operating at this stage of psychosocial development. One interesting approach along this line is represented by the current investigations of Donald Pelz and his colleagues at the University of Michigan (8, 11).

I would venture a guess that unless we develop better methods of analyzing the critical aspects of the driving task itself, unless we find better ways of differentiating one course from another, in terms of underlying rather than formal characteristics, unless we relate particular methods to particular types of subjects, and unless we try, in at least some test cases, a total-push approach to driver education, then our chances of finding truly significant influences on accident or violation rates will remain relatively small. Furthermore, unless we also control in our evaluations for the effects (in either direction) of potentially covarying influences such as sex, age, socioeconomic status, intelligence, and nature and extent of driving exposure, unless we can deal with large enough numbers of cases over long enough periods of time, and unless our criterion measures in terms of accidents and violations are themselves reliable and valid (as is too often not the case currently), we will not know whether a significant influence of driver education in relation to these measures has been exerted or not.

One must also bear in mind that when we speak of trained versus untrained drivers, we are not being precisely accurate. The so-called untrained driver is actually an individual who has been trained, either poorly or well, outside the context of a driver education course, and this may in some instances make the job of demonstrating independent effects of driver education courses more difficult. Thus, for example, a boy given fifty hours of on-the-road instruction by a relative who happens to be an expert driver under a wide variety of driving conditions, together with lots of reading and discussion, could provide formidable competition for the typical *30-and-6* course. Yet we really know next to nothing about how non-driver education subjects actually do learn to drive.

Thus far, I have concentrated largely on the criterion measures of accidents and violations because these have received greatest attention. There may, of course, be other goals, as a number of experts in driver education have pointed out, such as convenient and efficient provision of entry-level driving skills, knowledge of the transportation system, general safety education, emergency care or first aid training, and so on. These may also constitute perfectly valid goals. But if we are to be expected to provide research evidence regarding the efficacy of driver education in meeting these other goals, it is clear that they must be clearly spelled out, and that well-planned, scientifically controlled ways of investigating them need to be devised.

Above all, we need to get away from cliches and myths, and, worst of all, the bland perpetuation of obvious error. Driver education, as the Secretary's Advisory Committee Report (10) notes, faces many of the problems of education in general. Just as we are not going to stop sending children to school until we know more about the effects of schooling on performance, it does not appear likely that we are going to suspend driver education programs, pending more adequate research information. But while operational programs continue, we all face a challenge and a responsibility to exercise all the ingenuity we can muster to learn more about the nature of the human-task interaction that is driver education, and ways of improving it and of investigating its effects in a reliable and valid manner.

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MODERN LEARNING PRINCIPLES AND DRIVER EDUCATION

Robert M. Gagné
Professor of Education and Psychology
University of California, Berkeley

Dr. Gagné is a Professor in the Department of Education, University of California, Berkeley, in the field of educational psychology. He received his undergraduate education at Yale University, and his doctoral degree in experimental psychology from Brown University in 1940. He has been actively engaged in research on human learning for many years.

From 1958 to 1962, Dr. Gagné was a Professor of Psychology at Princeton University, where he carried out a series of studies of the acquisition of knowledge and collaborated with the University of Maryland Mathematics Project in studies of mathematics learning. From 1962-65, he was the Director of Research of the American Institutes for Research, where he was concerned with general supervision of research programs on human performance, instructional methods, educational objectives, design and evaluation of curricula and educational procedures. His writings during this period dealt particularly with methods of instruction, problem-solving, and the conditions of learning. In his current position, he has continued his research on the learning of school subjects.

Among his publications are "The Acquisition of Knowledge", Psychological Review, 1962, 69, 355-365; The Conditions of Learning, New York: Holt, Rinehart and Winston, 1965; and "Contributions of Learning to Human Development", Psychological Review, 1968, 75, 177-191.

In many fields of education, when one searches for clues concerning the relations between principles of learning and approaches to instruction, he finds data from a number of carefully done empirical studies to guide him. Such is the case, for example, with a subject like mathematics, or with a subject like reading. It is true to a more limited extent for the learning of science, and to a still more limited degree for social studies. In the field of driver education, however, it is quite apparent from the outset that information about how people learn to drive, how fast they learn to drive, and how well they learn to drive is sparse indeed.

Accordingly, my approach to the topic must be determined by this absence of quantitative information and data. Rather than summarizing for you what has been found about the acquisition of competence in automobile driving, I shall need to describe instead what general conclusions about learning, drawn mainly from tasks other than driving itself, can be applied to the design of instruction in driver education. In doing this, I shall not neglect, however, whatever findings appear to be relevant to this subject to be found in research sources.

Being a good automobile driver is evidently a complex affair. It surely must include the following components:

1. Moving the vehicle at near-zero speeds in various directions and into spaces of restricted dimensions. Example: Parking, backing into a designated space.

2. Moving the vehicle at moderate to high speeds in a manner which follows certain reference "tracks," such as those of the road edge, including going around corners and curves. Example: Road and highway driving, no traffic.

3. Driving on roads and highways containing other vehicles, people, or objects, in such a manner as to avoid collisions. Example: Driving in traffic.

4. Executing signals, braking, and other acts whose effect is to aid the progress and safety of other drivers and vehicles. The best known example: Using turn or hand signals.

5. In moderate to high speed driving, responding to unpredictable events by carrying out proper emergency actions. Example: Turning off the road to avoid a sudden obstacle.

6. Carrying out procedures which are legally prescribed, regarding such acts as speed control, stopping at intersections, signalling, parking, and many others. Examples: Stopping at a red light; yielding to traffic at a yield sign; keeping within posted speed limits.

If good driving is such a complex matter, one surely must avoid, first of all, any assumption that there is some single essence to it. One cannot say that good driving is "really" a matter of proper fundamental skills, or a matter of proper attitudes, nothing more. On the contrary, good driving is all the things I have mentioned. The skills and attitudes relevant to each one of them must be learned. None can be omitted.

Varieties of Learning

One of the ideas from the field of learning research which can usefully be applied to the problem of driving instruction is that there are different varieties of learning, each leading to a different kind of capability, and each requiring a different set of instructional conditions (1, 2). If competent driving is a complex matter, then it should be possible to reduce this complexity by identifying the different types of learning that are involved in the separate kinds of performance required. Having done this, it should be possible to state what conditions of instruction will be most effective for accomplishing the learning in each case, and what conditions will be less effective.

If we examine the six kinds of driving activities I have mentioned, it can be seen that they comprise several different kinds of learning, each requiring different instructional conditions for optimal effectiveness.

For example, Number 2, driving the vehicle on the road, is primarily a motor chain, or a motor skill, and is composed of no other kind of learning to any great extent. It is by no means the only motor skill involved in driving--in fact, there are many--but it does have this character almost exclusively. Does it have to be learned? Certainly it does. One must learn to follow the road, whether straight or curved, at moderate to high speeds. Perhaps the most important thing to be noted about this kind of activitity is that it requires certain conditions for its learning; these are practice under a variety of "tracks" with the vehicle itself. Learning a motor skill requires the stimulation provided by kinesthetic feedback from the muscles. It requires, in popular language, "getting the feel of the car." Furthermore, it cannot be acquired in any other way. One can give oral instruction that is endless, without accomplishing this kind of learning. Simulated practice is also of very little use, unless the simulator in fact reproduces the "feel" of the vehicle, which would entail useless expense. There must be practice with the car, on the road. Nothing else will accomplish the desired learning.

A slightly different example is Number 1, moving the vehicle in various directions at near-zero speeds. Here, what is being learned are various procedures, such as putting the car in particular positions, backing, turning, and others. Now these are what I call "rule-governed behavior," since they require the individual to accomplish a class of actions to a class of stimuli. (Please note that rule does not refer to a verbalized rule, such as "always look behind," but rather to behavior that is regulated in a predictable manner.) However, although these procedures are predictable in their effects, they incorporate simpler forms of behavior which are also motor chains.

Moving the car forward at minimal speed is one; moving it backward at minimal speed is another; turning the wheels while moving at these speeds is a third; and surely a number of others can be identified.

As a first step, then, we are back again with the requirement for learning motor chains -- that they must be practiced directly, using the vehicle itself, in order for learning to take place. There are no shortcuts to the effects of direct practice. As a second step, however, these simpler motor chains must be put together into longer sequences called procedures, which are governed by rules. In learning these, there are some advantages to practicing in a somewhat abstract manner. For example, one may ask the question: How do you proceed to turn the car around on a two-lane road? Being able to answer this question verbally has some advantages for the person who is learning to drive. However, it obviously does not accomplish the needed integration of simpler motor skills into a smoothly flowing procedure.

Number 3, driving so as to avoid collisions, is again a slightly different kind of learned activity. First of all, it assumes that such motor skills as have previously been mentioned have already been learned. In this case, the driver-learner must acquire a different set of rules. The effect of these rules is not at all to improve his "feel of the car," or his skill at "maneuvering." Instead, their effect is to avoid collisions with objects, cars, or people. These are the rules about signalling, braking, watching, accelerating, passing, and others of that sort. These rules must be learned by the driver by having him respond to as great a variety of relevant situations as one can manage. Provided that basic motor skills have indeed been acquired, this is one area in which the simulator can be of great help. The function of the simulator for this kind of learning, as more than one study has pointed out (5, 4) is to provide a variety of situations for practice which goes beyond what could be provided by using the car itself.

Of particular interest in the list of activities previously described is number 5--responding to unpredictable events by carrying out proper actions and emergency procedures. Here is an activity that goes beyond mere rule-using. This kind of learning is problem solving. The driver must be able to make the quick decisions which prevent an accident by taking some kinds of unusual action, in situations whose specific features are quite unpredictable. Can he practice such problem-solving directly? Not to any great extent, since the variety of situations he must be prepared to meet are so uncertain. How can he be prepared, then? The answer is by learning to carry out certain procedures among which he may have to choose when he is faced with the emergency situation. These are procedures like keeping the car straight _after_ a bump; straightening the vehicle _after_ beginning to skid; maintaining control of the vehicle _after_ driving off the road. It seems a little unlikely that these somewhat "unusual" kinds of skills are given much attention in driver education. Yes it is in fact these kinds of rule-following behaviors which contribute to the meeting of novel problem-solving situations in driving.

The Cumulative Nature of Learning

Different aspects of the totality of automobile driving, according to this reasoning, must be learned in different ways, under different conditions for learning, if optimal results are to be achieved.

There is still another characteristic of the learning process which may profitably be taken into account in designing instruction for auto driving. This is the _cumulative_ nature of learning effects. By this is meant the fact that learning not only establishes capabilities for carrying out specific performances on the part of the learner, but in each such instance it also provides a residue--a potentiality for positive transfer to further learning. For example, when a novice driver acquires the skill of holding the clutch at a point which keeps the car stationary on a hill, he has also learned a capability which will make the learning of a variety of other skills easier--controlling the speed of the vehicle during parking maneuvers, for example. Learning has a cumulative effect which shows itself in positive transfer to further learning.

The implication of this characteristic of the learning process is important. If we can determine the subordinate skills which contribute positive transfer to the learning of the skills we want ultimately to establish, it will be possible to arrange a _sequence_ of learning events which represents a highly effective arrangement of objectives for instruction. To find out what these subordinate skills are, and what order they occur in, it is necessary to make an analysis of the skills representing the ultimate goals of instruction.

For example, learning the skilled procedure of parallel parking involves a number of subordinate skills, which I have attempted to outline in Figure 1. When I describe some of them here, remember that I am not necessarily trying to describe the order in which they are employed in the total procedure, but merely their presence as subordinate skills. What the figure shows on the second line is a set of rule-governed behaviors which are involved in the total procedure of parallel parking. Each of these in turn depends upon the learning of certain classifying skills, often called concepts. These in turn depend for their learning on the prior learning of motor chains, such as positioning the vehicle, backing at low speed, and so on. Many of these have previously been mentioned.

The figure is intended to emphasize the cumulative nature of learning. More and more complex kinds of behavior are built up, by a process of positive transfer, from simpler kinds of behavior. Even the simplest skills, illustrated here, are built up by this process from even more basic skills. It is notable, for example, that a motor chain like backing at minimal speed itself depends upon the more basic skill of controlling the car's speed down to zero by the use of the clutch. Here is surely an example of a component skill which transfers broadly to quite a number of different performances of the automobile driver.

The figure illustrates a theoretical principle of learning. The principle is, learning of higher-level skills is substantially facilitated by the previous learning of lower-level skills. Practically speaking, this means that learning efficiency will be best if one progresses from simpler to more complex skills. Does this mean it is impossible to learn parallel parking "all at once," or by practicing the procedure from start to finish? No, it does not mean that it is impossible. It does mean that it is, by and large, inefficient. To make sure that the learner has mastered the basic skills first is a learning procedure that has the greatest chance of being successful fastest most often.

Similar analyses are possible for other kinds of terminal performances, even to one like "responding to unpredictable events," shown in Figure 2. If such events are truly unpredictable, it is all the more evident that establishing driving competence becomes a matter of having the student learn the many subordinate skills, both intellectual and motor, which he will need to have available in meeting unexpected situations and solving novel problems. (For a different kind of analysis of subordinate skills, see Herbert [3]). The figure indicates the kinds of rule-governed behaviors which are likely to be used in solving

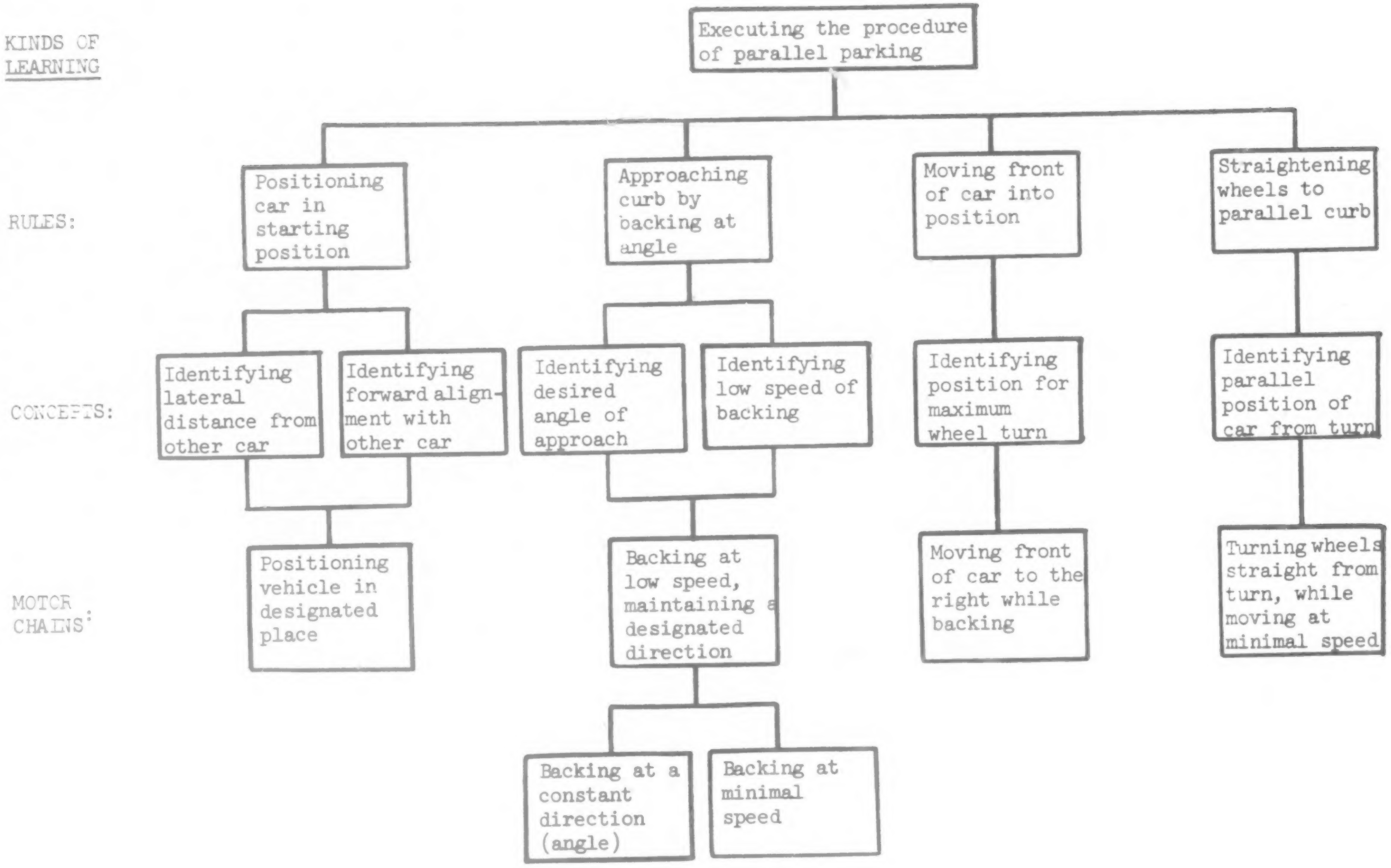
KINDS OF LEARNING
RULES:
CONCEPTS:
MOTOR CHAINS:
Executing the procedure of parallel parking
Positioning car in starting position
Approaching curb by backing at angle
Moving front of car into position
Straightening wheels to parallel curb
Identifying lateral distance from other car
Identifying forward alignment with other car
Identifying desired angle of approach
Identifying low speed of backing
Identifying position for maximum wheel turn
Identifying parallel position of car from turn
Positioning vehicle in designated place
Backing at low speed, maintaining a designated direction
Moving front of car to the right while backing
Turning wheels straight from turn, while moving at minimal speed
Backing at a constant direction (angle)
Backing at minimal speed

Fig. 1. A procedure: parallel parking.

Problem-solving: unpredictable events

RULES:	Braking: (1) preparing for or avoiding collision; (2) extra force to keep wheels straight; (3) continuing to aim vehicle; (4) procedure for slippery road	Fast turning: (1) avoiding turnover; (2) extra force to maintain direction in rough conditions; (3) foreseeing limit to turn	Acceleration: (1) estimating amount of forward motion; (2) continuing to aim vehicle	Collision: (1) Maintaining desired position and direction of vehicle on road; (2) avoiding additional movement which would involve other cars
CONCEPTS:	(1) Estimating braking distance; (2) Identifying position of steering wheel in maintaining straight wheels; (3) Identifying aim of vehicle; (4) Identifying skid	(1) Identifying optimal turning radius; etc.	(1) Identifying amount of forward motion with acceleration; etc.	(1) Identifying position of vehicle on road, etc.
MOTOR CHAINS:	(1) Maintaining wheels straight while braking hard, with uneveness in brakes; (2) Aiming vehicle to pass through narrow aperture while braking; (3) Driving while applying brakes on slippery road	(1) Turning fast without capsizing; (2) Following courses on rough road, frequent turns, fast speed	(1) Acceleration to avoid collision of vehicle approaching from side; (2) Aiming vehicle in target direction while accelerating	(1) Maintaining direction when vehicle bumped from side; (2) Maintaining position of vehicle when bumped head-on or from behind

Fig. 2. Some components of driving.

these difficult and unexpected problems, the kinds of categorizing skills or concepts upon which these in turn depend for their learning, and the kinds of motor chains that are even more basic. Again, the theoretical implications of the chart are that learning the basic motor skills facilitates the learning of the concepts, which in turn makes easier the learning of the required rule-governed behaviors. Beyond this one cannot go--one simply hopes that meeting a genuine unexpected emergency will find the driver prepared with a repertoire of skills that will make possible good decision making.

Instruction

Designing effective instruction for driving can thus be viewed as a matter of first, identifying both terminal and component skills, and second, setting up reasonable conditions under which they can be learned.

The right conditions for instruction are going to vary with the nature of what is being learned. In automobile driving, particular contrasts can be drawn between the optimal conditions for learning motor skills (like backing straight), rule-governed behavior (such as procedures at a four-way stop), and problem solving (as in taking emergency action). The driving simulator is the source of some good examples. Depending on its particular makeup, some kinds of capabilities can be well taught by means of a simulator, others poorly, and still others perhaps not at all.

Consider category No. 4, which I mentioned at the beginning -- executing signals, braking, and other acts the effects of which aid the progress and safety of other drivers and vehicles. Can these be taught by lecturing, or by the learning of verbal answers to verbal questions? Certainly not. Can they be taught in a simulator? Very well indeed, provided one can assume that the more basic motor chains have been learned some other way, so that they can be put together when the execution of the total procedure is called for.

What about category No. 6--carrying out legally prescribed procedures? Can these be taught by verbal means? To a considerable extent, yes. Staying within the speed limit is a rule which can quite effectively be reinstated by means of verbal cues, such as the sign that says "Speed Limit 50." Does simulator training contribute to such learning? Not markedly, I should think, although perhaps simulator practice can contribute somewhat to the habitual nature of the use of these rules in a variety of situations.

What about category No. 1--maneuvering the vehicle at minimal speeds? No one would imagine, I suppose, that these basic motor skills could be established by verbal instruction. How about a simulator? Well, that is a reasonable question. But such a simulator would need to have the physical dynamic characteristics of an automobile, and this would be economically indefensible. For the basic motor skills, then, one must face the fact that nothing can replace the motor vehicle itself.

The truly effective simulator would probably be a kind of specially designed driving course, requiring perhaps 20 acres of ground. It would have various kinds of roads and road surfaces, backing spaces, turning spaces, and so on. It would be, in other words, a place where basic skills could be practiced in an automobile. The basic skills would be not only those which are used frequently, like rounding a curve, but also those which are used infrequently, such as keeping the wheels straight after hitting an unexpected bump; or driving through a narrow aperture. Such practice would be intended to insure that the most highly generalizable skills were well learned first. After that, the rest would be easier.

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TOWARD A COMPREHENSIVE PLAN FOR EVALUATION OF DRIVER EDUCATION AND TRAINING PROGRAMS

Harry H. Harman
Educational Testing Service

Mr. Harman is presently Senior Research Psychologist and Director of the Office of Computation Sciences at Educational Testing Service. He is also serving as Principal Investigator on the project, "Evaluation of Driver Education and Training Programs."

Prior to joining ETS in 1966, he was associated with the System Development Corporation in California for 13 years. In 1963 he was named one of the Corporation's Principal Scientists engaged in research and consultation on statistical methodology, computer experimentation, and simulation problems. Earlier work in statistics includes an appointment as Research Associate at the University of Chicago, a position as Supervisor of the Division of Research and Statistics, Illinois Department of Public Welfare, and as Chief of the Statistical Research and Analysis Section, Personnel Research Branch, Department of the Army, in Washington.

Mr. Harman is a graduate of the University of Chicago, and was awarded B.S. and M.S. degrees in mathematics. He has published widely on statistical methods and is the author of *Modern Factor Analysis*, now in its second edition and considered the definitive work on the subject.

From 1962 to 1966, Mr. Harman was a member of the Accident Prevention Research Study Section of the National Institutes of Health, and in 1967-68 he served as consultant to the Institute for Educational Development in its Driver Education Evaluation Study Group. He is a Fellow of the American Psychological Association and President of the Psychometric Society.

1. BACKGROUND

The project in which I am engaged is one in a series designed to provide guidance to the National Highway Safety Bureau regarding the problem of evaluating driver education programs. The impetus for these studies is a provision in the Highway Safety Act of 1966 which authorizes Federal assistance to state and local agencies in carrying out highway safety programs, including driver education and training.

In fulfilling the congressional mandate, NHSB needs to know what benefits will accrue from a given expenditure of funds on one or another of several different programs, or on one or another activity within a given program. The benefits of primary concern to the Bureau are reductions in highway fatalities, personal injuries, and property damage. To be sure, accurate estimates of costs and benefits associated with different safety programs are difficult to get at the present time. However, pending development of adequate performance criteria and appropriate cost-benefit analysis techniques, the NHSB is trying to lay the groundwork that will make possible scientific evaluation of programs in the various areas for which it is responsible.

One area of responsibility is that of driver education and training. While this program is educational in nature, it is nevertheless perceived by the Bureau as an integral part of the over-all highway safety program. As such, it may be said to be in competition with the other highway safety programs (e.g., driving and alcohol, seat belts, licensing, enforcement, etc.). But it is also true that the driver education program is a supra-safety program -- proper education can influence materially all the other highway safety programs. Perhaps this is the reason that driver education and training was specifically identified in the Highway Safety Act of 1966.

2. OVERALL PLANNING STRATEGY

The strategy used in planning research for the evaluation of driver education and training programs is indicated schematically in the chart on the next page. In the Spring of 1967, NHSB contracted with four agencies to develop plans for evaluating the effectiveness of current or proposed driver education programs. These four organizations are represented on the program today, namely:

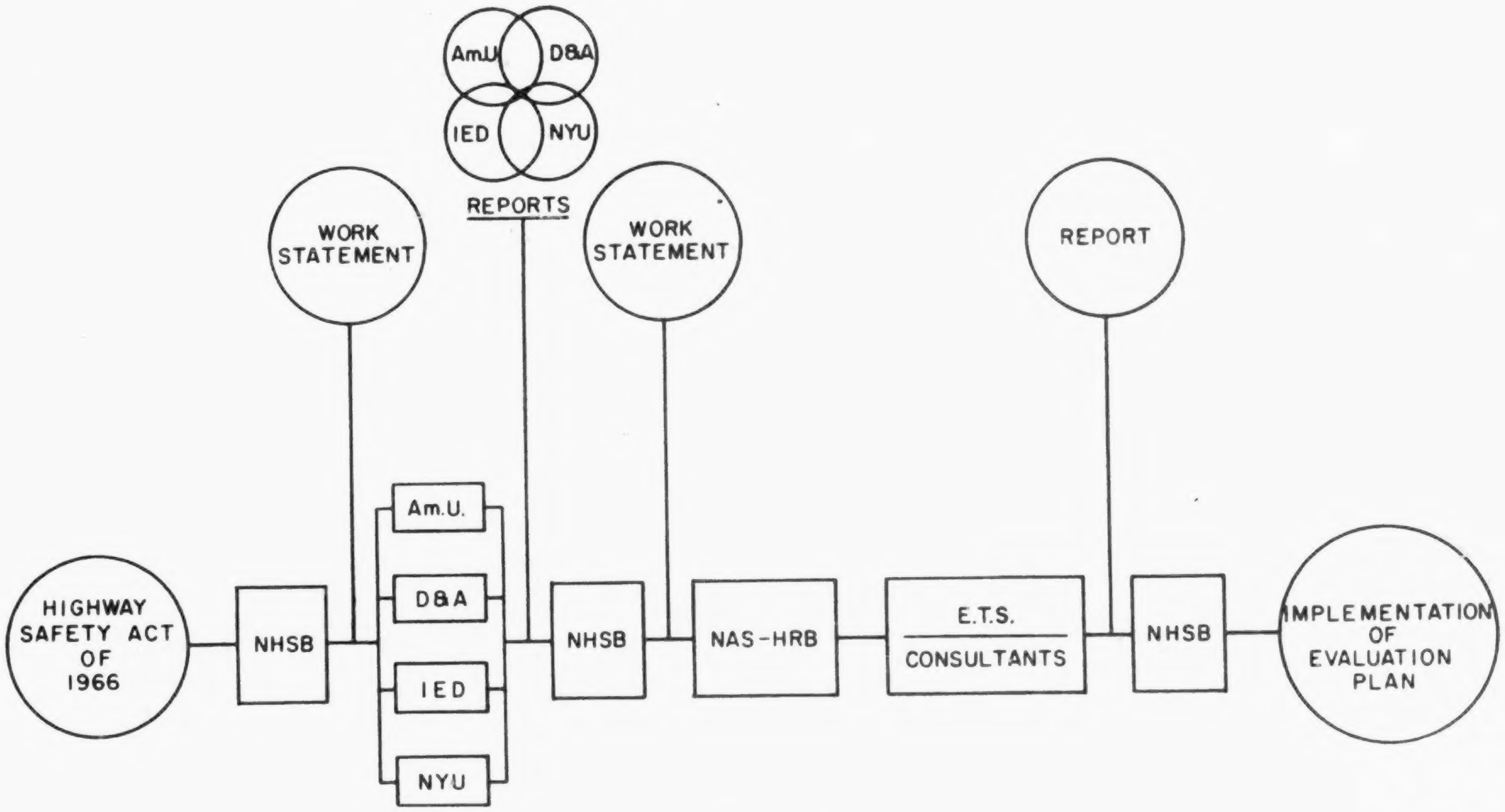
AmU = The American University
D&A = Dunlap and Associates, Inc.
IED = Institute for Educational Development
NYU = New York University

Each of the four contractors received the same Work Statement containing a set of general objectives and eight specific tasks. The results of these studies are represented by four reports which became available in the summer of 1968. These reports contain many common elements and a number of unique features.

To synthesize the information contained in the four reports the NHSB contracted with the National Academy of Sciences, Highway Research Board, to recommend plans for evaluating driver education programs on a national basis. The product of the new study was to be another report. On the basis of the latter report, and using whatever means seem appropriate, the NHSB hopes to be in a position to start the final step in this process -- the actual implementation of evaluation plans for driver education and training programs.

3. CURRENT PROJECT STRATEGY

The strategy employed by the NAS-HRB in carrying out the current project was to appoint a panel of advisor-consultants


HIGHWAY SAFETY ACT OF 1966
NHSB
WORK STATEMENT
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NAS-HRB
E.T.S.
CONSULTANTS
REPORT
NHSB
IMPLEMENTATION OF EVALUATION PLAN

LEGEND

AmU = The American University
D&A = Dunlap and Associates, Inc.
IED = Institute for Educational Development
NYU = New York University

NHSB = National Highway Safety Bureau
NAS = National Academy of Sciences
HRB = Highway Research Board
ETS = Educational Testing Service

Fig. 1. Planning process.

and to subcontract with the Educational Testing Service (with which organization I am associated) for the necessary staff work. The panel was convened both as an advisory group to NAS and as a group of consultants to our staff. Panel members brought to the project a diversity of disciplines. They included educators, psychologists (with specialties in education, engineering, human factors, and research), operations research scientists, and statisticians. While some have devoted a major part of their professional career to the field of driving safety and education, others have been concerned with more general problems of human behavior, man-machine systems, and general philosophical and methodological aspects of experimental design and evaluation. With so much diversity and talent present, it is not surprising that they should have sought creative approaches to the problem of designing evaluation methods for driver education programs.

The objective set forth by the NHSB for this particular study was the selection and/or synthesis of evaluation instruments developed under the four concurrent research contracts, followed by the development of plans for evaluating driver education programs on a national basis. Within the framework of the general objective the work statement specified five tasks, which can be summarized as follows:

1. familiarization with the four feasibility studies;
2. development of a system of classification for comparing and combining data in the four feasibility studies;
3. selection of evaluation instruments, with the rationale for the selection;
4. identification of criteria for evaluating the effectiveness of driver education programs; and
5. development of experimental research plans, based upon the four reports, for validating the evaluation systems for driver education and training programs.

While the procedure to be followed in implementing the foregoing statement of work looks straightforward, its very simplicity is deceiving. In order to develop a sound validation plan or to have a basis for selection of "instruments," one must have a clear definition of objectives or goals. None were available. While the four reports contain excellent reviews of the literature and discussions of the difficulties of getting valid measures of driver proficiency, they do not provide clear-cut statements of goals or definitive criteria for use in evaluating program effectiveness. For this reason, our panel of consultants elected to go beyond the simple task of comparing the four evaluative proposals. It was their goal -- through creative synthesis -- to take a significant step forward.

4. STATUS OF DRIVER EDUCATION EVALUATION

The four feasibility studies provide a comprehensive review of the status of driver education and its relationship to traffic safety. From these reviews it is evident that at the present time it is impossible to draw valid scientific inferences regarding the impact of driver education on subsequent driving performance (particularly as measured by accidents and traffic violation). This point ran through all four reports, and is summarized succinctly in the NYU study (on which Dr. Brody reported). Quoting from that report, there are these two statements:

> 1. *No clear proof has as yet been produced showing that driver education, as presently constituted, has significant favorable effect on driver performance.*
>
> 2. *No clear proof has as yet been produced showing that driver education, as presently constituted, does not have a significant favorable effect on driver performance.*

A related observation is made in the AmU study (on which Dr. Lybrand reported):

> *...prior evaluation studies have not provided clear, consistent, objective evidence which allows an impartial person to conclude with confidence, one way or the other, that one type of driver education and training program, as currently taught, is more effective as an accident countermeasure than any other type of program.*

These are but manifestations of the more general situation recognized in the Moynihan Report (Secretary's Advisory Committee on Traffic Safety, 1968). The Report refers to traffic safety as "...an almost wholly uncharted area" and urges the establishment of "...carefully elaborated and comprehensive national goals" (p. 35). Such a statement of goals could then serve as a basis for setting priorities and for determining the allocation of resources to different safety programs. In working toward the achievement of such goals, however, the Report points out three cautions that must be observed: first, "traffic safety research must henceforth be conducted at the very highest levels of methodological rigor, and of scientific and intellectual relevance"; second, both research and its application "will involve many concepts and activities that are considerably at variance with views held by the public at large"; and third, stemming from the newness of the field, "there do not exist even the most rudimentary standards of performance by which to measure achievement" (pp. 37, 38). While these observations were directed to considerations of research for safety programs of all types, they certainly apply to the driver education program in particular.

The idea for the four concurrent feasibility studies probably was born in the course of developing the following finding and recommendation of the Moynihan Report (p. 57):

> *"Unfortunately, the present state of knowledge as to the effectiveness of driver education provides no certainty, and much doubt, that the return on this enormous prospective effort will be commensurate with the investment. A broad and systematic inquiry is needed into the general question of how driving behavior is acquired, and how drivers can be taught not only to operate automobiles, but also to understand the major problems of highway safety..."*

When the four investigators began their studies they quickly found the "accident countermeasure" effect of driver education programs to be very elusive. They recognized that driver proficiency is only one component in an effective highway transportation system, and that accident reduction is only one measure of improved driver proficiency. Further, all agreed on the futility of trying to pinpoint the effects of driver education to subsequent accident experience, especially in view of the difficulties in finding adequate data. All four reports placed considerable emphasis on the fact that the objectives of driver education must aim at the ultimate development of driver proficiency in the real world, as reflected in efficient traffic flow as well as accident reduction.

Despite the fact the driver education programs are well established there was agreement that analysis of the driving task in the real world is crucial for developing and validating programs designed to change driving behavior. As parallel to the need for task analysis, they agreed on the need for the development of more objective measures of driving capabilities and attitudes.

The apparent agreement on the existing problems and general objectives does not mean that there was concurrence as to how the evaluation effort should be carried out. For example, there are differences in the preferred methods for tackling the task analysis and for establishing valid measures of driving behavior. Except for agreement on the need for a survey of existing driver education programs (which is a specific task in the Work Statement of the four contractors), there are very great differences in their proposals for research. These vary from a brief reference regarding the need for the establishment of a driver information base to an elaborate, highly specific experimental design.

The goal of my project is to try to resolve some of these differences and to come up with a viable evaluation plan.

5. SOME THOUGHTS ON EVALUATION PLANS

The difficulties inherent in making good, sound evaluations of the effectiveness of driver education programs are recognized by the Bureau, and they served as the justification for having four concurrent studies made of this problem. Of course, these difficulties are not unique to driver education -- they hold for all education. Witness the following statement from the recent Secretary of the Department of Health, Education and Welfare:

> *When the Office of Education was created in 1867, it was charged with the collection of "such statistics and facts as shall show the condition and progress of education in the several States and Territories". Yet today, over 100 years later, we still lack the essential yardsticks to me-sure progress in education. (Wilbur J. Cohen, Social Indicators: Statistics for Public Policy, American Statistician, October, 1968, p. 16.)*

The development of such yardsticks for driver education is the ultimate objective being sought by the NHSB. There is no quick and simple solution to this complex problem: valid evaluation procedures can emerge only from long-term research efforts.

The view of the present contractor -- shared by the four original study contracts -- is that the ultimate goal of this research is the accurate measurement of driving proficiency and the sound evaluation of driver education programs. However, in order that some progress be made, the total complex problem must be broken down into manageable components. Stating an ultimate goal does not imply waiting for the fulfillment of the ever elusive "grand design." By taking reasonable steps along the way, current needs can be met, although of questionable validity at first. These should be subject to revision and improvement in technique as experience is gained. Such an iterative process, involving feedback loops, can lead to a continuous upgrading in evaluation methods.

An overall plan for meeting the ultimate goal -- the development of operational evaluation instruments to assess the effectiveness of driver education programs -- will involve two major phases:

1. an experimental phase: involving development and validation of evaluation instruments, using real-world "driving performance" as the criterion;

2. an operational phase: will make use of these "validated instruments" to evaluate the driver education and training programs.

The first phase, the validation of instruments, is both difficult and costly to accomplish. While a set of evaluation instruments may be relatively easy to administer and measurements may be easily obtained, getting good (or valid, or meaningful) driving performance measures may require new technologies and considerable development. Getting such driving performance measures can be done only on an experimental basis. The second phase, general use of instruments, should ideally wait until the validation in the first phase has been accomplished. However, if the evaluation instruments are to be validated against criterion measures of driving performance, we may be a long way from accomplishing this. Still, a great deal of preliminary work, based on expert judgment and analysis, can lay the groundwork for attaining the ultimate goal and serve the evaluation needs in the short term as well.

In such an overall strategy for evaluation it is necessary to distinguish between activities that might be done quickly and those that will require substantial effort. Such distinctions may be identified as follows:

Immediate - referring to steps that can be taken now, employing only the means at hand, to evaluate driver education.

Short term - referring to evaluation procedures that can be developed and be made usable in a year or two.

Long term - referring to evaluation techniques employing scientific and technical means that may require five years or more to develop.

Anticipating some delay before new evaluation procedures (even subjective ones) could be developed, NHSB established its "immediate plan" by issuing the general guidelines contained in Highway Safety Program Standard 4.4.4. These standards are sufficiently broad in scope to encompass more specific requirements of the state and local agencies that might evolve from short-term and long-term research efforts.

The four reports all suggested some kind of survey of driver education courses as a means of cataloging existing programs or as an immediate or short-term measure. We focused our attention on short-term and long-term evaluation procedures.

A good "short-term plan" should provide a basis for longer-range research as well as an interim technique for evaluating current driver education programs. The following steps are prerequisite to an ultimate solution to the problem:

1. Identify the traffic-related tasks and the knowledges, skills, and attitudes required to perform these tasks.
2. From the preceding task analysis, determine what the objectives of a driver education program should be.
3. Develop a short-term evaluation instrument for measuring the attainment of the objectives as reflected in the content of driver education programs.

To accomplish these three steps will require the skills of the most experienced professionals in driver education and traffic safety. For the first of these steps, they would be well-advised to seek the assistance of experts in task analysis who developed the technology for military man-machine systems. From such a task analysis would be derived the objectives of driver education stated in behavioral terms (i.e., what the driver must do), and an instrument to assess the program content.

During the course of the short-term developmental work -- a period of at least one year and perhaps as long as two years -- planning for the long-term evaluation should be initiated. This would involve identification and specification of the research and development required to provide suitable driver performance criterion measures and for the refinement of evaluation instruments.

As noted earlier, the development of driver performance criterion measures is at the crux of a scientific evaluation procedure. Attainment of the ultimate goal is many years in the future so some useful intermediate procedures are desirable. One way of recognizing the different levels at which this problem can be approached is to consider the evaluation task in either of two ways: (1) by expert judgment, comparison with some standards, or other measurements of the program content; or (2) by observation, rating, or other measurements of the individuals exposed to the training program, so that with proper statistical controls it becomes possible to draw inferences about program effectiveness.

The first approach is the easier one, although less valid. The survey of driver education courses proposed in the four reports is a simple use of this approach. A short-term evaluation instrument is an improvement on this. The second approach, involving measurements on individual drivers, is much more difficult to accomplish, but clearly can lead to more valid results. Because of the difficulties, time, and cost that would be involved, this approach should probably be limited to experimental studies.

The main objective of any long-term plan must be the conduct of research with the expectation that operational evaluation instruments could then be based on it. Looking toward efforts extending over five years or longer, it is not unreasonable to expect technological advances and imaginative research to cope with problems which appear insoluble at present. Specifically, we might expect progress in our ability to measure driving behavior in the real world. When realistic measurement of driving behavior of individuals can be obtained, then a truly scientific determination of the effectiveness of a training program can be made.

In summary, let me emphasize again that driver education cannot be considered in isolation as an "accident countermeasure." The ultimate objective of reducing highway fatalities, personal injuries, and property damage will be realized only if a concerted effort is brought to bear by the Federal government, the state and local communities, and the public at large to make all aspects of the highway traffic system more safeworthy. Vast improvements in the vehicles, the highways, and the traffic control procedures, as well as in the behavior of drivers are needed to bring about such objectives. What goes into driver education should be influenced by the rest of the system and should be flexible enough to respond to changes.

DRIVER EDUCATION TODAY AND TOMORROW

Norman Key
Executive Secretary
National Commission on Safety Education

Dr. Key, Executive Secretary of the National Commission on Safety Education of the National Education Association, joined the NEA Headquarters staff in 1951. His earlier professional experience includes public school teaching and administration in Alabama, and traffic consultation with the American Automobile Association, Washington, D.C.

Dr. Key received his Bachelor of Arts degree from Howard College, Birmingham, in 1938. In 1947 he received his M.A. degree in education from George Washington University. He received his Ed.D. degree from The American University in June, 1959.

At the national level he has offered courses and led conferences on school transportation in many states, and has taught military officer instructors to retrain disabled service people as well as to train military ground motor vehicle fleet operators. He has contributed to accident prevention research and to the writing of textbooks and other curriculum materials in the field.

Some of Dr. Key's affiliations include the National Education Association, American Driver and Traffic Safety Education Association, American Association of School Administrators, American Academy of Political and Social Science, the American Sociological Association, and American Educational Research Association.

The Commission contributes to research in accident prevention and prepares instructional materials for teachers on different phases of safety education. Guides on safety administration, instruction and protection for school administrators are also published by the Commission.

The instructions given to me were to discuss the current state and future planning for the field of driver education. It should be stated at the outset that today's schools have accepted the responsibility for teaching people to survive and to live effectively. Authorities are in substantial agreement that the school is the best place for teaching and learning safe behavior. This does not mean that such behavior cannot or should not be learned elsewhere. It simply means that the school provides the optimum learning environment for more people at less cost, since schools are society's organized approach to equipping children and youth with the knowledge, the skills, and the understandings which they need. Typically, driver education is offered at the grade level where students are at or near the minimum legal driving age. Within this framework driver education has become established in the schools and colleges of the United States.

CURRENT STATUS

Safety education, including driver education, had its beginning before 1920. But the breakthrough in American schools came with the publication of the 1940 yearbook, Safety Education, by the American Association of School Administrators. Then followed the World War II period which saw only sketchy advances; but among these were the development of pre-induction driver education which many secondary schools offered at the urging of the War Department, training for wartime motor fleet operation, and wartime training for school bus drivers and supervisors.(1)

Recognizing that the quality of driver education in schools across the nation depends upon policies and standards developed by educators themselves, the National Education Association's Commission on Safety Education administered and published the reports of several national conferences. Each conference concentrated on program improvement. Representatives of many safety agencies contributed to these national conferences. The widely used conference reports have served as guidelines for improving driver education in the nation's schools and colleges.

Since 1960, Evaluative Criteria (2), an overall guide for assessing all aspects of secondary education, has contained a section on driver education. Thus, when professional evaluation teams representing the regional associations of colleges and secondary schools review the offerings of a high school in connection with accreditation, driver education is assured of consideration along with other subjects found in a comprehensive high school program.

Professional Organization to Strengthen Driver Education

Following the marked increase in high school driver education after World War II, active state groups of teachers began formation of professional driver education teachers assocations in a number of states. Today such professional organizations exist in 42 states. With the assistance of the National Commission on Safety Education, the American Driver and Traffic Safety Education Association was formed in 1957. It became a department of the National Education Association in 1960. Currently 40 states associations are affiliated with the national association. The growing leadership of these groups is contributing to the refinement of the body of knowledge in the field and to the strengthening of driver education courses in high schools as well as of teacher preparation programs in colleges and universities.

The Body of Knowledge in Driver Education

That there is a body of knowledge essential to the development of competent members of 'traffic society' is widely recognized, though there is also a keen awareness that refinement and extension of this body of knowledge are necessary. It should be remembered that this specialized body of knowledge has been developed in a relatively short period in the history of American education, starting with the mere review of accident statistics and the memorizing of safety rules.

This body of knowledge is frequently treated in a two-part full semester course of instruction. The two parts consist of classroom instruction and practice driving or laboratory instruction. Three factors have influenced the growth of this curriculum: (a) the demand for effective citizenship training (knowledge, skills, attitudes), (b) the problems and cultural interests of young people, and (c) the nature of learning safe traffic behavior. (3) Driver education also has important relationships to the biological, physical, and behavioral sciences. The combination of concepts from these disciplines with the unique body of traffic safety knowledge provides a basis for greater insight and understanding of the individual's role on our streets and highways. "The body of knowledge in driver and traffic safety education may be conceived in terms of content needed by the teacher, first, to develop the learner's driving capability and, second, to develop informed traffic citizens." (4)

Program Variations

One of the challenges for schools today is to design driver education courses to meet a wide variety of needs. For example, a growing number of young people need to know how to operate a motor vehicle safely in connection with part-time or even full-time occupations. In addition, increased leisure time spent in driving exposes more people to a wider range of traffic conditions for which they need special preparation. Adults and out-of-school youth also have unique instructional needs. These are among the reasons why the education community is increasingly concerned with planning and implementing instructional programs such as the following:

- driver education designed to prepare individuals for a vocation,
- initial driver education courses for adults and out-of-school youth,
- special traffic safety instruction for senior citizens, and
- programs for disabled persons.

Recent action by the U. S. Department of Labor, in connection with child labor regulations, has an interesting relationship here. The action has the effect of waiving the restrictions against 16-and-17-year-old drivers whose operation of a motor vehicle is "only occasional and incidental to the child's employment"(5) provided (among other things) such a minor has completed a state-approved driver education course. States are also allowed to apply for exemption under this special Department of Labor regulation for employing under-18-year-old student drivers of school buses.

Legislative Support for Driver Education

Legislative support for driver education has been provided in several ways. Some states offer special instructional permits for students of approved driver education courses. This student permit, provided for learners in the school year or semester immediately preceding their reaching legal driving age, is recommended in the Uniform Vehicle Code.(6) In the laws of 33 states, separate provision is made for practice driving instruction by students enrolled in approved driver education programs, either by special permit or in some other way.(7)

Recently, the National Committee on Uniform Traffic Laws and Ordinances added to the Uniform Vehicle Code the recommendation that states require applicants for the driver's license who are under 18 years of age to have successfully completed an approved driver education course.(8) Currently, 26 states have adopted this practice.

Financial Support for Driver Education

Legislators at the state and Federal levels have recognized the need for financial support for driver education. Financial support for programs in secondary schools is provided in 35 states, and some of these include provisions for research and for teacher preparation. Funds for such support are provided in four ways: (a) appropriations from general state funds (all the people pay), (b) vehicle registration fees and driver's license fees (owners and operators pay), (c) learner's permit fees (learners pay), and (d) fines for traffic law violations (transgressors pay).(9)

In the 1965-66 school year, the Elementary and Secondary Education Act of 1965 began to provide financial support for driver education.

The funding of driver education projects under this Act may be determined largely by state and local school systems, and the states and communities are not required to match the Federal funds. A number of state and local school systems are improving driver education under this Act.(10)

It is now well known that the Highway Safety Act of 1966, which requires continuous and progressively more comprehensive highway safety programs at all levels, specifically requires driver education.

Contributions of business and industry to driver education are worthy of note. Of some 25,000 automobiles used in driver education programs during the 1967-68 school year, more than 90 percent were loaned by automobile dealers through special arrangements with the manufacturers at no cost to the schools.(11)In addition, a number of light trucks for vocational driver education have recently been made available to schools on the same basis.

The practice of allowing special reduced insurance rates on automobiles in families with teen-age male drivers who satisfactorily complete an approved driver education course is almost universal in the insurance industry.

Business and industry also provide scholarships for teachers of driver education, and produce numerous types of both hardware and software for driver and traffic safety instruction.

The foregoing are but some of the highlights of the status and scope of driver education in the United States. Details as to various program elements are not discussed. It is assumed that other papers presented at this symposium will include details on program elements such as the number of schools offering driver education and number of students enrolled; colleges offering teacher preparation programs; requirements for state certification of teachers; state and local school system supervisory services; and the cost of instruction.

A LOOK INTO THE FUTURE

Educators are concerned about moving ahead with varied and substantial improvements in driver education. Questions and problems abound as to what to tackle first and how to proceed. Choices are required among such aspects of the field as:

- ° organizing instructional schedules to accomodate more students,
- ° gearing financial support to provide for more students,

- arranging realistic in-service programs to help teachers become more proficient with innovative hardware and software,
- finding ways to incorporate related and important content like (a) alcohol and its effects on drivers and pedestrians, (b) motorcycle safety, and (c) meeting common emergencies, and
- building support for driver education by effective communication with the lay public.

In addition, we face such problems as:

- how to improve the qualifications of college professors,
- how to improve teacher preparation, and
- how to provide effective state level supervisory service to all schools.

These kinds of problems are not unique to driver education, but they are more prevalent in this field because of its relative newness as a school subject. It takes time -- more time than the 20 to 30 years driver education courses have been offered in the schools -- for widespread understanding and high commitment to develop in support of a program.

Let us look ahead, nevertheless, to some of the interesting, yes, exciting, dimensions which are likely to unfold as effort from many sources is directed toward the improvement of driver education.

Behavioral Sciences and Education

Research in the behavioral sciences is providing increasing evidence that difficulties in personal adjustment often underlie risk behavior. Even temporary conditions such as worry, fatigue, or extreme anger or joy can influence the way in which one behaves in a given situation or even how he approaches a learning task.(12)

We live in a 'technological age.' Man has survived through the ages largely because of his ability to adapt to the environment by improving his equipment for living. This evolutionary process has involved an increasingly sophisticated search for definition and analysis of specific tasks in a wide range of human activity. This matter of task analysis is dramatically demonstrated today in successful space exploration. Safety is an essential and integral part of the process of analysis for each task at every stage of development and operation. Task analysis involves foresight, planning, and recognition of hazards in complex situations. For the human component in such a situation, the process involves learning a series of coordinated subtasks for hands, feet, eyes, and ears and developing them to a semi-automatic level; learning to make judgements of changing space-time relationships; and learning to anticipate situations and conditions and to react correctly, often in split-second intervals.(13) This process is involved in such simple procedures as turning the pages of a book; it is obviously involved in complex situations such as occur in driving an automobile. Although in the simpler situations one may be unaware of the process, it is precisely when this process breaks down or is neglected that one wastes effort and is also more likely to fall victim to an accident.

It is difficult to generalize regarding the safe behavior of an individual without a knowledge of his personal condition, of the nature of the activity in which he is engaged, and of the characteristics of the situation. It is meaningless to speak of the 'safe driver' or the 'cautious man' without knowledge of the degree of risk he may take when engaging in a particular activity under a given set of circumstances. This would suggest that efforts at program improvement in driver education should incorporate a wide range of learning activities extending over a much longer period of time than does the traditional driver education course. It may even suggest extending the traffic safety learning experiences in a well-articulated fashion from elementary school through high school.(14) If so, then the question of how best to do this must also be answered. And this is not to suggest a single, best approach or prescription. For a program which concentrates on a single mode of learning and knowing is, by definition, extremely limited.

For program improvement in the future, one could hardly suggest a better approach than to use every means to stimulate the driver education practitioner to work hand-in-glove with the researcher, with a completely open mind for the improvement of a program. On the other hand, a researcher would gain much in the way of first-hand substantive knowledge of the field which he is researching if he would work closely with the on-the-job driver educator. It has been said that research tends to take on life of its own, and accumulates an internal logic that takes no account of the unique experience of any individual. Isn't this an appropriate word of caution for anyone planning to conduct research for improving programs in this field? Surely empirical knowledge is not to be cast to the swine.

Further in support of this approach, let us consider the convergence of various works including research among different disciplines in the behavioral sciences. Going back into the literature, one can see how the sociologist, the psychologist, and the psychiatrist formerly went their own separate ways, only to learn later that each had much to gain from the work of the others. Today we are witnessing increasingly the collaboration of scientists among the different disciplines in research and other efforts to improve the lot of man.(15)

Implications of Research

What does research say about driver education? Is there a feasible alternative for driver education? In a recent report of an advisory committee to the Secretary of Health, Education, and Welfare, emphasis was placed on the importance of research as a basis for improving the programs in driver and traffic safety education.(16) Such research is especially urgent now, since the Highway Safety Act clearly requires that the states provide comprehensive highway safety programs including driver education.

Accordingly, the advisory committee placed on the Federal government the responsibility for research leadership. Appropriate research agencies, the advisory committee suggested, would be the U. S. Department of Health, Education, and Welfare (including the National Institute for Mental Health and the Office of Education) working with the National Highway Safety Bureau of the U. S. Department of Transportation. This report directed some criticism at driver education as we know it today; and these critical comments made the headlines across the country. In a more realistic sense, the report was critical of the research on driver education and urged more research directed at improving the programs. In this connection the advisory committee stated that ". . . operational driver education programs must continue. . . . One would hardly advocate a moratorium on all schooling while looking for proof of better methods." (16)

The report also suggested that research consider many factors which have been neglected in assessing the effectiveness of, and in pointing the way toward instruction. These factors, known to many in the field of driver education and research, though admittedly not well understood, include amount and type of exposure (mileage driven), social class variables among involved drivers, intelligence, personality, etc. An in-depth inquiry is needed into the general question of how driver behavior, good or bad, is acquired. The transient state of attitude and of physical condition needs to be examined. All of these research areas, according to the report, place leadership responsibility on the Federal government.

As to the research on benefits of driver education, one might conclude that, at this point in time, the score is tied between the researcher as a proponent of driver education and the researcher as a critic of driver education. Too frequently, the proponents have used inconclusive evidence to demonstrate the favorable results. On the other hand, the critic, often lacking a substantive knowledge of the field which he was researching, has supported his criticism by employing data which are no better than those used by the proponent whose work he was criticizing. There is, then, no solid, irrefutable evidence that driver education does, in fact, reduce accidents. On the other hand, there is no solid, irrefutable evidence that driver education does not, in fact, reduce accidents. Thus, the score is even; it's a draw. This suggests that future research be redirected toward improvement of the program. To provide better instruction for more people at less cost is a wholly worthy objective for those who would do research in driver education.

It is not a question of whether to do away with driver education, as some critics would suggest. Rather, it is a question of what kind of instruction is more effective. At a recent Symposium on Automotive Safety sponsored by the American Medical Assocation in Washington, D.C., one speaker who has not always been complimentary in his remarks about driver education emphasized that even though there have been weaknesses in the program, we must get on with the training.

Do we need further proof that there is no alternative for instruction? Though it has not been proved beyond doubt that driver education prevents tragedies on our streets and highways, neither can one prove beyond doubt that fleas cause a dog to scratch. But the evidence of the value of driver education is overwhelming to those who have been close enough to a substantive program to sense first-hand the changes in understanding, insight, and skill that come about through this teaching-learning process. It is well known that quality differs considerably in various schools, and any evaluation of driver education generally should take quality into account.(17)

Driver education in itself is not a solution to all the highway problems. Perhaps our tendency in the past to assume that a person can be educated to overcome all highway inadequacies is a major reason that the program is under surveillance as it is today.

Without question the highway environment with all of its built-in booby traps has been a contributing factor in more highway tragedies than has heretofore been recognized. William Haddon has pointed out that a sign on the highway reading "Slippery When Wet" is an official admission that here is a built-in hazard. He has further indicated that the public should not be expected to tolerate this condition, nor should the public tolerate fixed poles or bridges with unsafe abutments that constantly threaten the lives of people when they can be removed, modified, or shielded to eliminate or minimize hazards. The best the driver education teacher can do is to make every effort to create a keen awareness on the part of the learner of these highway inadequacies and trust that he will have developed the understanding and insight sufficient to deal with most of them in a safe manner.

Closely related to the problem of highway inadequacy is the limitation of the human capacity to see and react within a safe margin beyond some upper speed limit from which point there is no return.

This field needs the interdisciplinary approach mentioned earlier. The researcher and driver education teacher can join forces to make a systems analysis of the highway problem. One of their objectives would be to translate the outcomes for application to the teaching-learning situation. This calls for the systems approach as utilized in other contexts in the development of a new orientation for innovations in driver education. Some studies have pointed out the need to know what skills are critical to the driving task.(18) Though some of the basic driving tasks have long been recognized by the driver education teacher -- such tasks as that of tracking which requires some minimum level of visual acuity and neuromuscular coordination -- he is well aware that the body of knowledge can be further refined and more adequately correlated through scientific identification of the driving tasks. No doubt the body of knowledge and the teaching methodology stand to be improved through a new plan of instruction, scientifically developed in relation to the entire system involving man, the machine, and the highway.

Improving the Learning Environment

Improving the learning environment involves humanizing the content for learning and the setting in which learning takes place. It means extending the learning environment beyond the classroom to the community and, indeed, throughout the life space of the individual.

The average youth, by the time he becomes a senior in high school, has viewed more than 15,000 hours of television in addition to hundreds of hours of public movies. These experiences plus the time he has spent with newspapers and magazines have exposed him to an almost insurmountable array of inhumanity -- inhumanity in the form of cruelty, violence (including violence on the highway), drunkenness, and dishonesty.

These same high school youngsters have been exposed to some 12,000 hours of schooling. Thus, for the school to provide and adequate antidote for what the student is exposed to in the rest of his waking hours, a superior program for instruction is paramount. The average driver education program today has three-tenths of one percent of a child's 12,000 hours of schooling in which to offer such superior instructional services. In driver education, then, we need to design every phase of the learning experience for maximum benefits. And when we say learning experience, we are again talking about more than what goes on within the four walls of the classroom. We must include the entire process of education -- the home, television, radio, newspapers, and all other media to which the learner is exposed.

Educational technology has become a formidable influence in the schools and colleges of the nation. Among the technological devices now finding their way into the classroom is the computer. Already computers are demonstrating their usefullness in teaching a host of cognitive skills. The computer, coupled with television, tapes, records, and other audio visual devices, makes possible unique instructional systems of sight, sound, and touch. (19) Thus, while driver education was in the forefront in its use of technology (such devices as simulators), our field now must do some catching up to gain pace with other subject fields.

While the computer can do some instructional tasks better than the human teacher, the teacher must always be in charge. Yet the teacher need not be the direct supervisor or coordinator of the computer. That can be handled by a paraprofessional. The important job yet to be done, and it must involve research, is to catalogue those aspects of instruction that are most appropriate for the machine, on the one hand, and for the human teacher on the other. What better subject than driver education in which to make this important forward thrust!

Mention was made earlier of the extension of the programs beyond one-semester and the inclusion of some instruction at lower grade levels as well as above. John Goodlad has foreseen computer consoles in classrooms and, in the foreseeable future, in homes just as television sets are found today. The computer system will be programmed by an adequate production of software materials from the school's learning center.(19) Again, driver education can be in the forefront of this movement. In the meantime why not program vastly more traffic safety materials throughout school curriculums and into the home through existing media? This entails the learner's acquisition of substantive knowledge but not his development of neuromuscular skills which, of course, must be gained under the guidance of a qualified teacher. Finally this position paper assumes the continuation of driver education as a student-centered program conducted by schools under the direction of qualified professional staff.

Driver education as we know it today has not reached maximum effectiveness. Though comprehensive, quality programs have demonstrated their worth, improvement can and will be made. The important thing at this point is to get on with the job at hand and to improve the program as we go. The objectives are vital and should not be lost in a cloud of semantics. The issue is life or death -- life or death for children, youth, and adults. They are the responsibility of our schools. They are worth working for; they are worth saving.

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DRIVER EDUCATION AND TRAINING: EVALUATION REQUIREMENTS AND SUGGESTED PLANS

William A. Lybrand, Director
Development Education and Training Research Institute
The American University

Dr. Lybrand received his B.A. in 1950 from Muhlenberg College, his M.S. in 1952 and his Ph.D. in 1954 from the University of Maryland in quantitative and social psychology.

He has been an Adjunct Professor at The American University since 1962, and Director of the Development Education and Training Research Institute at The American University since 1966. He was Director of the Human Resources Division of the Office of Research and Analysis, Agency for International Development from 1964-65.

Dr. Lybrand's experience includes extensive research and development on educational and training devices and systems. He has directed projects on functional design requirements for visual flight simulation for pilot training. At Carmody Corporation, a manfacturer of educational and training equipment, he conducted analyses of education and training requirements in a variety of school, industrial, and military settings. At AID, he was responsible for planning and implementation of a broad program in technical assistance research, including educational assistance.

At DETRI, he has been principal investigator of a planning and evaluation interview study of the effectiveness of international education and training programs of the Agency for International Development (AID) and of an Office of Education sponsored study on the use of innovative media in public school systems, as well as Principal Investigator of the Driver Education and Training Project.

There were two basic perspectives from which we approached our job of developing plans for evaluating driver education and training programs, not only as they exist today, but as they might be taught in the future.

First, we conducted our study in a "systems analysis" framework. This led us to accept the following basic propositions, which although elementary to some, must be made explicit to avoid subsequent misunderstandings.

1. Highway system performance effectiveness is the outcome of the interactions among motor vehicles, roadways (including traffic conditions) and driver behavior--not just the outcome of driver behavior.

2. Injuries, deaths, and property loss are inadequate measures of highway system performance effectiveness when used alone; these must be supplemented by measures of efficient and successful movement of people and goods.

3. Nor are injuries, deaths, and property loss any more adequate as measures of driver behavior when used alone; and furthermore, even when adequate

real-world measures of driving performance are developed, the effects on these performance measures of the vehicle and the roadway, including traffic conditions, must be taken into account.

4. Driver education and training programs, aimed at driver performance, must be coordinated and linked with other "people-oriented" programs, such as licensing and law enforcement programs, if they are to be optimally effective.

Second, we regarded evaluation of any education and training course generally to be better served by objective data--that is, data resulting from direct measurement of behavior of students--than by subjective data--the judgments of individuals about student behavior, or a course, which clearly are more susceptible to private, personal biases. Obviously, objective data are not always available and subjective data must be used--but not as an excuse to delay, or substitute for, initiation of action to acquire objective data. Along with this view, we envisioned two roles for evaluation. The first, which we call a formative evaluation role, uses the information from evaluation studies to assess how well instructional goals are being achieved by a course. The second, a pay-off evaluation role, focuses on the value of achieving these goals. Goal achievement by a course may be unimportant if the goals are not worth achieving. In summary, we were oriented toward objective data collection for use in both formative and pay-off evaluation studies.

Our approach--which initially consisted of analysis of all the available literature, interviews with driver educators and trainers, observation of education and training programs --including vocational programs, and consultation with safety researchers of all kinds--led us quickly to accept the oft-repeated need for improved design of evaluation studies. However, we felt that much more is involved in achieving sound objective evaluation--formative or pay-off.

In our analysis, we developed three additional requirements. These are listed in Figure 1.

Let me discuss each of these in turn very briefly, because the need for meeting these requirements provides part of the rationale for the remainder of our study approach, and the resultant evaluation plans which emerged.

The first requirement stems from what I believe to be a "cultural lag" in driver education and training with respect to instructional objectives. Through time, instructional techniques have been adapted to developments

DET EVALUATION REQUIREMENTS

REFORMULATION OF DET INSTRUCTIONAL OBJECTIVES IN TERMS OF REAL-WORLD DRIVING PERFORMANCE PROFICIENCY.

REFINEMENT OF ULTIMATE CRITERIA OF REAL-WORLD DRIVING PERFORMANCE PROFICIENCY; INCLUDING BUT NOT LIMITED TO, IMPROVED ACCIDENT DATA COLLECTION - TO VALIDATE INTERMEDIATE CRITERIA.

DEVELOPMENT OF NEW INTERMEDIATE CRITERIA OF REAL-WORLD DRIVING PERFORMANCE PROFICIENCY AS STANDARDIZED MEASURES OF BEHAVIORAL OUTCOMES - FOR USE IN EXPERIMENTAL "FORMATIVE" AND "PAY-OFF" EVALUATION STUDIES.

Fig. 1. DET evaluation requirements.

in highway system hardware--changes in car design, in traffic rules, and so forth. But I do not see any compelling evidence that instructional *objectives* have been significantly modified to reflect the rather dramatic changes in driving behavior requirements that have accompanied these hardware developments, and the growth of the highway system.

This is critical, because it has become rather well established in education and training that clear, precise statements of instructional objectives, defined in terms of *intended observable behavior outcomes*--that is, in terms of *what students are supposed to be able* to do following an educational or training experience--are absolutely essential for sound evaluation. (As an aside, they also are recognized as essential for the development of quality courses.)

Driver education and training do not lack stated objectives --hardly any course does. But the concepts of "skilled drivers" or "good traffic citizens" leave much to be desired when it comes to evaluation. And when the surface of either of these concepts is scratched to obtain specific guidance on the behavior to be evaluated, the "cultural lag" of which I spoke, appears. Let me be specific about what I mean.

In the early days of driver education and training, when there were fewer people, even fewer drivers and vehicles, and when the highway system was not complex, even though irregular, it is understandable that an adequate description of the *driving-specific* behavior required, focused on, indeed was largely limited to, the few simple, psycho-motor manipulative skills involved in controlling the movement of the car.

However true it may have been in the past, such a description of driving performance is most inadequate today. The modern traffic environment contains *driving-specific* performance requirements--such as visual scanning, gap-closing judgments, speed and path decision-making, which in and of themselves are skill requirements not defined adequately in terms of manipulative skills. Today's driving situations require performance proficiency which goes beyond that involved in the few basic maneuvers found in existing road-tests and licensing procedures. And, however else a man may live in other life situations, morally or immorally, he must cope successfully with these *driving-specific* performance requirements if he is to be a proficient driver.

Unfortunately, despite some window-dressing, the instructional objectives of driver education and training today still reflect the underlying presumption that manipulative skills are the primary driving-specific behaviors in driving proficiency. They are obviously necessary skills, but they are far from sufficient skills. Until an adequate description of the full range of behavioral performance required by real-world driving situations today is reflected in instructional objectives, evaluation will be inconclusive, controversy over instructional approaches will continue, and little dent in the slaughter on our highways can be expected from education and training.

I will not spend much time on the next two requirements. Clearly, for evaluation purposes, new and improved ultimate criteria of real-world driving proficiency are required that include, but are not limited to, violation and accident data. Even when they are developed, however, they would not be suitable for direct use in evaluation studies.

Sound evaluation requires standardized measurement conditions so that we can know the effects that different factors have on the performance we are measuring. In addition, of course, accidents are low probability events and the expense and effort to acquire these and other positive measures over a long enough period of time is prohibitive. For these reasons, routine use of real-world ultimate criteria in evaluation studies is neither desirable nor practical.

The primary use of such new and improved real-world proficiency measures would be to validate new intermediate criteria of driving proficiency--our third requirement.

We are suggesting that new objective tests of driving proficiency are required which measure driving performance in common and critical driving tasks, during which the student can perform well or poorly without undue risk to his physical well-being, or to that of others. Life-like driving behavior, in which knowledges, skills, and attitudes are reflected, must be measured in situations which simulate real-life.

Our emphasis on driving behavior does not mean that we believe paper and pencil knowledge tests are useful in evaluation, particularly in formative evaluation studies. It does mean that we consider that knowing what to do is not the same as doing what is known, and that the best prediction of how well a student will perform in real-world driving will be measures of how well he performs in driving situations that are most like the real world. I will have more to say about intermediate criteria when I discuss our evaluation plans.

As I indicated earlier, the key building-block for meeting the first requirement, and indeed the third requirement, simply does not exist at the present time in driver education and training, or anywhere else, for that matter--that is, an adequate description of the driving behavior proficiency required to meet real-world driving performance requirements.

Developing such a statement is obviously a massive long-term undertaking. At this point in our study, we opted at least to begin that undertaking, feeling that there was much empirical evidence that could contribute to at least the initial steps of a task analysis of driving performance.

We realized at the time that we were opting for long-term objective evaluation and that there were pressing needs for immediate evaluation plans; our hopes and expectations were, however, that there would be meaningful peel-offs from this effort that could be used for immediate subjective evaluation. Figure 2 schematically illustrates, then, this study approach.

It is true, of course, as Miller has said, that an actual description of performance requirements may often seem meager and trivial when compared with the ritualistic forms of education and training which are provided. But in the long run, there is no substitute method which is likely to produce as meaningful and useful a set of instructional objectives and evaluation instruments.

For our driver performance analysis, we used relatively straight-forward task analysis techniques.

As a first result, we defined the objective of the generic driving task as indicated in Figure 3. Every time a person gets into a car to take a trip he has these objectives. Given the specific content of a trip, it can be seen that his real-world proficiency can be measured in at least five ways, in terms of accomplishment of the task objective.

With this task objective as a frame of reference, we then examined accident data and other literature on driver performance to see if we could identify driving situations in which differences in the probability of successful accomplishment of the task objective suggest that different performance requirements are being placed on the driver by those situations. We ended up with a kind of taxonomy of task situations which is shown in Figure 4.

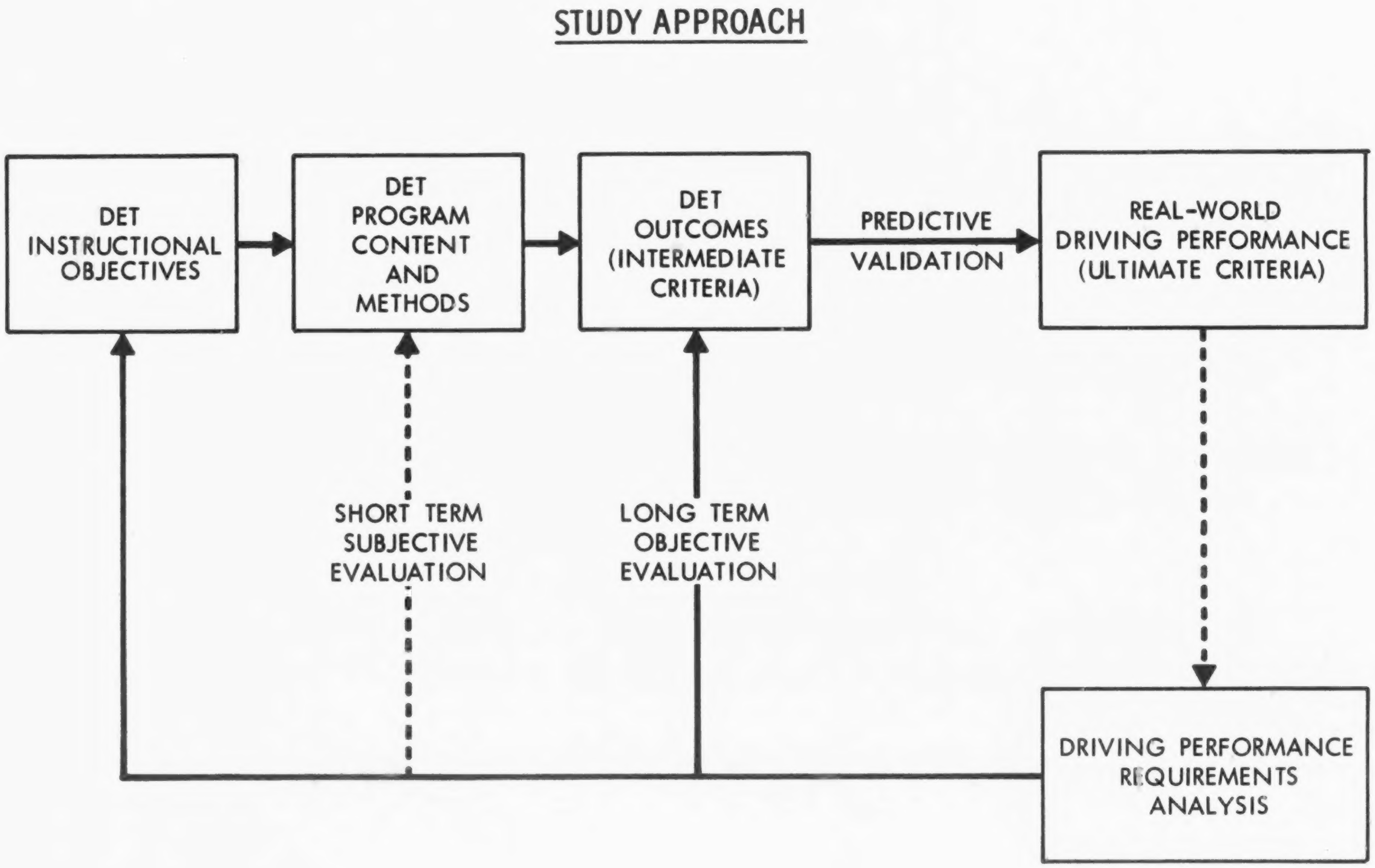
STUDY APPROACH
DET INSTRUCTIONAL OBJECTIVES
DET PROGRAM CONTENT AND METHODS
DET OUTCOMES (INTERMEDIATE CRITERIA)
PREDICTIVE VALIDATION
REAL-WORLD DRIVING PERFORMANCE (ULTIMATE CRITERIA)
SHORT TERM SUBJECTIVE EVALUATION
LONG TERM OBJECTIVE EVALUATION
DRIVING PERFORMANCE REQUIREMENTS ANALYSIS

Fig. 2. Study approach.

DRIVING TASK OBJECTIVE

THE GENERIC DRIVING TASK OBJECTIVE OF A MOTOR VEHICLE OPERATOR IS:

TO CONTROL THE MOVEMENT OF HIS VEHICLE IN ITS ENVIRONMENT:

1. TO MOVE THE VEHICLE FROM ONE LOCATION TO ANOTHER LOCATION WITHIN SPECIFIED TIME LIMITS;
2. ON DEFINED ROADWAYS;
3. IN PATHS AND VELOCITIES COORDINATED WITH PATHS AND VELOCITIES OF OTHER INDEPENDENTLY CONTROLLED VEHICLES AND PEDESTRIANS ON THE ROADWAYS;
4. WITHOUT COLLISION WITH OTHER VEHICLES OR PEDESTRIANS ON OR NEAR THE ROADWAYS, OR WITH FIXED OBJECTS NEAR THE ROADWAYS;
5. WITHIN THE BOUNDS OF APPLICABLE OPERATIONAL RULES OF THE MOTOR VEHICLE TRANSPORTATION SUB-SYSTEM (LAWS AND PRUDENTIAL NORMS).

Fig. 3. Driving task objective.

DRIVING TASK MATRIX

SETTING / MODE	URBAN		RURAL		LIMITED ACCESS	
	LOW STRESS	HIGH STRESS	LOW STRESS	HIGH STRESS	LOW STRESS	HIGH STRESS
OPEN ROAD DRIVING TASKS						
ENTERING & LEAVING TRAFFIC TASKS						
TRAFFIC FLOW TASKS						

Fig. 4. Driving task matrix.

As you can see, the taxonomy has three major dimensions, with variations in these dimensions being associated with different probabilities of accomplishing the driving task--and, by definition, differences in skill requirements on the driver. The dimensions are: the roadway setting, that is, rural, urban or limited access roadways; the driving mode, that is, open-road driving, entering and leaving traffic driving, and traffic flow driving; and driving stress, that is, unanticipated events in the environment, or events in which the temporal span for the driver to respond is very brief.

We next examined the data a little more closely to translate the 18 driving situations into driving tasks, using the driving mode as our major classification device. The 15 pro-typical tasks listed in Figure 5 emerged.

When variations in roadway settings and in stress conditions are used with this list, some 80 situational driving sub-tasks result. We believe that these 80 sub-tasks are representative of and provide comprehensive coverage of the range of performance requirements with which a driver must cope in the real world if he is to be proficient.

Two conclusions follow. First, if education and training is given in these 80 sub-tasks, the student is likely to be a better driver than if he is not given such learning experiences. Second, if a student performs well on intermediate criterion measures on these sub-tasks, he is likely to perform well in the real-world in ultimate criteria.

The next steps in the task analysis will involve the development of "scenarios" for each sub-task in which the situational environment is specifically identified--the objects in the environment, how other traffic moves, etc.--and in which the driver's behavior is described in terms of good and poor responses to that environment. These steps went far beyond the time and resources available to our study, but we did initiate them. We organized the available empirical evidence regarding performance proficiency according to situational factors and driver characteristics, including human proficiency in conducting the specific guidance functions involved in operating a motor vehicle.

Beyond situational driving performance measurements, we identified two additional categories of tasks on which criterion measures must be taken. These are shown in Figure 6.

The first, which we call instrumental tasks, really refer to the marriage of the driver with the vehicle; they are

PROTOTYPICAL DRIVING TASKS

OPEN ROAD DRIVING TASKS

A. STRAIGHT ROUTE DRIVING
    1. MAINTAINING PATH WITHIN ROAD LANES
    2. ADJUSTING SPEED TO ROADWAY CHARACTERISTICS AND TRAFFIC CONTROL SIGNS AND SIGNALS

B. TURNING AT INTERSECTIONS AND INTERCHANGES
    1. ADJUSTING PATH/POSITION TO TURNING LANES
    2. ADJUSTING SPEED TO ROADWAY CHARACTERISTICS AND TRAFFIC CONTROL SIGNS AND SIGNALS

ENTERING AND LEAVING TRAFFIC TASKS

A. ENTERING FROM OFF-ROAD STOPPED POSITION
    1. LEAVING ROADSIDE STOP
    2. LEAVING ALLEYS AND DRIVEWAYS
    3. LEAVING PARKED POSITION
        a. ANGLE
        b. PARALLEL

B. LEAVING TO OFF-ROAD STOPPED POSITION
    1. STOPPING ON ROADSIDE
    2. ENTERING DRIVEWAY OR ALLEY
    3. PARKING
        a. ANGLE
        b. PARALLEL

TRAFFIC FLOW TASKS

A. MOVEMENT WITHIN TRAFFIC FLOW
    1. FOLLOWING PRECEDING VEHICLE(S)
    2. PASSING PRECEDING VEHICLE(S)

B. CHANGING MOVEMENT INTO OTHER TRAFFIC FLOWS
    1. AT INTERSECTIONS
    2. AT MERGING FLOW LOCATIONS
        a. CONVERGING ROADS
        b. ENTRANCE INTERCHANGES
    3. AT DIVERGING FLOW LOCATIONS
        a. BRANCHING ROADS
        b. EXIT INTERCHANGES

Fig. 5. Prototypical driving tasks.

INSTRUMENTAL AND ANCILLARY TASKS

BASIC VEHICLE CONTROL AND COMMUNICATION PROCEDURES:[1]

1. ENTERING AND LEAVING VEHICLE PROCEDURES
2. ACCELERATION
   a. FORWARD MOVEMENT
   b. BACKWARD MOVEMENT
3. DECELERATION
4. TURNING
5. COMMUNICATIONS

ESSENTIAL NON-DRIVING PROCEDURES:

1. VEHICLE INSPECTION AND MAINTENANCE PROCEDURES
   a. PRE-TRIP INSPECTION
   b. PREVENTIVE MAINTENANCE
2. SAFETY HARNESSES AND SEAT BELT PROCEDURES
3. POST-COLLISION PROCEDURES
   a. ORGANIZATIONAL
   b. FIRST AID

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[1] The performance of many of these control procedures is dependent upon specific vehicle design. This caveat applies most frequently to transmission designs: Automatic, Three Speed Manual or Four Speed Manual.

Fig. 6. Instrumental and ancillary tasks.

instrumental because without proficiency in these simple tasks it is unlikely that he could cope successfully with the 80 situational driving sub-tasks. The second category of these tasks is considered ancillary, because the tasks are not components of driving performance per se, but rather separate procedural tasks.

Finally, we identified a series of knowledge items which would seem to be necessary for proficient driving (Figure 7.) These are listed as knowledge categories, in the first instance, simply because it is impossible to represent all the situational and traffic environments in a measurement situation, or for that matter, in the entire set of learning experiences in a driver education and training course. These would seem to be the knowledges most relevant in a stimulus-generalization sense in order for the driver to cope with new and different environments which he has not previously experienced, nor on which he was measured. In the second instance, the knowledges refer to those non-driving factors which have been empirically demonstrated to be related to accident probability and severity. As such, they are critical to the driver's assessment of risk as he copes with differing the performance requirements in his situational driving tasks.

These, then, are the highlights of the task analysis which we initiated on driving performance. From this work, we were able to reformulate a set of instructional objectives which seem to us to be meaningful in terms of real-world driving performance proficiency, and which can be used to begin intermediate criterion development (Figure 8.)

You will note, first, that we have limited the general instructional aim to entry into the real-world highway system. More specifically, we have limited the terminal instructional objective in time to five years in recognition of the influence of post-driver education and training learning experiences on actual on-the-road driving. Such a limitation also recognizes that with the passage of time the influence of any specific learning experience, or set of learning experiences, is likely to merge with other influences in such a way as to mask effectively the independent influence of any single learning experience.

The first enabling objective stresses performance in the prototypical driving tasks shown earlier, or some similar set.

The second enabling objective recognizes the impossibility of providing a student with all the specific stimulus cue patterns with which he will be faced during the first years he is driving.

ENABLING KNOWLEDGES

HIGHWAY SYSTEMS

STRUCTURAL DESIGN CHARACTERISTICS
TRAFFIC MOVEMENT DYNAMICS
FEDERAL, STATE, LOCAL LAWS AND REGULATIONS
PRUDENTIAL NORMATIVE TRAFFIC RULES

COLLISION RELATED CONDITIONS

DRIVER CONDITIONS (E.G., ALCOHOL, DRUGS)
TASK-SHARING BEHAVIOR (E.G., "MAKING-OUT")
MOTOR VEHICLE LIMITATIONS AND FAILURES
HIGHWAY SYSTEM DESIGN INADEQUACIES
FAILURE TO FOLLOW LAWS AND PRUDENTIAL NORMS

Fig. 7. Enabling knowledges.

PROPOSED DET INSTRUCTIONAL OBJECTIVES FOR EVALUATION STUDIES

GENERAL INSTRUCTIONAL AIM

TO DEVELOP PROFICIENT INITIAL DRIVING ABILITIES IN STUDENTS.

TERMINAL INSTRUCTIONAL OBJECTIVE

THE STUDENT HAS THE ABILITY REQUIRED TO DRIVE A MOTOR VEHICLE EFFECTIVELY WITHIN THE HIGHWAY TRANSPORTATION SYSTEM DURING THE FIVE YEARS FOLLOWING COURSE COMPLETION.

ENABLING INSTRUCTIONAL OBJECTIVES

1. THE STUDENT HAS THE DRIVING PROFICIENCY, INCLUDING THE SPECIFIC KNOWLEDGES AND SKILLS, TO EXECUTE A COMPREHENSIVE RANGE OF DRIVING TASKS ON TYPICAL ROADWAYS IN A VARIETY OF SPECIFIC DRIVING ENVIRONMENTS, INCLUDING BOTH COMMON AND CRITICAL TRAFFIC SITUATIONS.
2. THE STUDENT HAS INFORMATION, BOTH FACTS AND PRINCIPLES, ABOUT THE MOTOR VEHICLE, THE MOTOR VEHICLE TRAFFIC SUB-SYSTEM, AND CONDITIONS WHICH MODIFY DRIVER PERFORMANCE PROFICIENCY AND INCREASE COLLISION RISK, WHICH ALLOWS HIM TO UTILIZE HIS DRIVING ABILITY IN SPECIFIC ROADWAY AND TRAFFIC SITUATIONS DIFFERENT FROM THOSE HE HAS DIRECTLY EXPERIENCED PREVIOUSLY.
3. THE STUDENT GAINS PERSONAL SATISFACTION IN PERFORMING DRIVING TASKS IN ROADWAY OR TRAFFIC SITUATIONS WITH A HIGH LEVEL OF PROFICIENCY, I.E., ACCOMPLISHING HIS MOTOR VEHICLE TRIP PURPOSE, WITHIN LAWS AND PRUDENTIAL NORMATIVE RULES OF THE ROAD, WITHOUT COLLISION, HIGH COLLISION RISK, OR OTHER HIGHWAY TRANSPORTATION SUB-SYSTEM DEGRADATION.

Fig. 8. Proposed DET instructional objectives for evaluation studies.

The third enabling instructional objective is phrased to imply only that the student acquires the capability during the course to be aware that proficient driving behavior can have a positive affective component, and that he has begun to attach emotional significance and value to it. The objective does not go so far as to imply preference (attitudes) or commitment, and is much less internalized than an organized value system, or a consistent philosophy of life.

And now, to get to our recommended plans which are shown in Figure 9.

As a short-range plan it is clear that we are limited to subjective evaluation. Accordingly, we would suggest a survey of driver education and training courses to assess the extent to which learning experiences with high content validity to real-world driving performance are being included, and, secondly, the amount of supervised practice which is being given in common and critical driving tasks.

This recommendation is directly based on the evidence from some driving research in England, and on much indirect evidence from other research on complex psycho-motor skills, which suggests that regardless of age, early learning is accompanied by frequent and large errors which diminish with practice. Thus, the high accident rate of youth, somehow mystically attributed to their chronological age, may be no more than a cultural artifact. This is the time of life when most are acquiring driving skills, and consequently may be more a function of inexperience and early learning errors than anything connected with their physiological age, or only weakly related to their emotional immaturity, socio-economic level, or similar factors.

As an intermediate-range plan, I am suggesting a technique whereby we can stimulate and use the vast reservoir of experience in improving driver education and training programs that lies within the instructors who conduct them. What we are saying here is that if we can put some sound evaluative instruments in the hands of teachers, many can be expected to adjust their curriculum offerings in innovative and imaginative ways.

Finally, our long-range plan, as you might have suspected, focuses on a whole-task simulator. We are suggesting one for each FHA region after development, in a mobile van, which can be used as a continual evaluation instrument in each regional area in a program of experimental pay-off evaluation studies.

SUGGESTED DET EVALUATION PLANS

SHORT RANGE

SURVEY OF DRIVING PERFORMANCE PROFICIENCY CONTENT VALIDITY OF LEARNING EXPERIENCES, AND AMOUNT OF SUPERVISED PRACTICE IN COMMON AND CRITICAL TASKS.

INTERMEDIATE RANGE

DEVELOPMENT OF STANDARDIZED FIELD-TESTS OF TASK PERFORMANCE PROFICIENCY, USING LOW-COST SIMULATED "PROPS" IN SITUATIONAL SCENERIOS, ADAPTABLE TO PARKING LOTS, OFF-STREET RANGES, CLOSED SECTIONS OF ROADWAYS, AND CAREFULLY CONSTRUCTED RATING SCALES; DEVELOPMENT OF PAPER/PENCIL TESTS OF ENABLING KNOWLEDGES - FOR USE IN FORMATIVE EVALUATION STUDIES IN OPERATIONAL SCHOOL PROGRAMS.

LONG RANGE

DEVELOPMENT AND VALIDATION OF MOBILE-VAN, WHOLE-TASK, HIGH-FIDELITY PERFORMANCE PROFICIENCY MEASUREMENT SIMULATOR, WITH CLOSED-LOOP VISUAL AND MOTION CUE CAPABILITIES - ONE FOR EACH FHA REGION FOR USE IN PAY-OFF EVALUATION STUDIES.

Fig. 9. Suggested DET evaluation plans.

It is recognized that the development of such a simulator will be a lengthy and costly process, involving perhaps a five-year development period and a $10 million cost for a prototype and nine production units. The accident problem, however, has been with us for a long time and is likely to be with us for a much longer time, and five years may be an insignificant time period from that perspective. And $10 million, while undoubtedly a very significant sum of money even in terms of the Federal budget, represents only one-tenth of one percent of the computed annual costs of accidents.

A SCHOOL ADMINISTRATOR VIEWS DRIVER TRAINING EVALUATION

Sidney P. Marland, Jr.
President, Institute for Educational Development

Dr. Marland is President of the Institute for Educational Development. He brings wide experience in education at all levels to the work in which IED is engaged. He has deep interest in urban problems and accomplishments in urban education that are especially significant at this time.

Dr. Marland received his A.B. and M.A. from the University of Connecticut in 1936 and 1950, respectively, and a Ph.D. from New York University in 1955. The University of Pittsburgh conferred an honorary LL.D. upon him in 1966.

Before accepting the presidency of IED, he had been Superintendent of Schools in Pittsburgh, Penn., since 1963. Before going to Pittsburgh, Dr. Marland held similar posts in Winnetka, Ill., and Darien, Conn., for a total of twenty years as school superintendent.

He has been active in various national organizations, serving on the boards of National Educational Television, National Merit Scholarship Corporation, and the Joint Council on Economic Education. Vice Chairman of the 1965 White House Conference on Education, he is presently on the Presidential Advisory Council on Education of Disadvantaged Children and the Presidential Advisory Council for the Office of Economic Opportunity. He is President of the Research Council of the Great Cities Program for School Improvement and a member of numerous professional associations, including the American Association of Chief School Administrators.

In his opening remarks, S. P. Marland, Jr., President of IED spoke to the need for sober, unemotional examination of the subject of driver education in the schools of the nation. Reflecting upon his twenty years as a superintendent of schools, Dr. Marland declared that boards of education regularly found themselves sharply divided on the large issues of public policy surrounding driver education. *Boards of education*, he stated, *are familiar with controversy, and are able generally to reach a consensus, even though painful, on most controversial topics which the schools must confront.* One can describe this as a profile of the feelings of board of education members spread upon a normal curve of distribution, with the consensus, say on the question of sex education, falling at the mode. However, on the subject of driver education one can generally count on polarization -- two modes at the extremes of the curve of distribution of feelings. Boards and school administrators need the pooling of wisdom from conferences such as this one to guide them in this cloudy arena.

Dr. Marland listed some of the points of conflict between positions separating some boards of education members, in which school administrators needed help in guiding policy formulation.

1. Dubious evidence of results of driver education as now conducted.

2. Excessive emotional support for the program based on assumed implications for saving lives.

3. Attractiveness deriving from automotive industry support in the unlimited loan of dual control vehicles. (No similar advantage, for example, for teaching physics or spelling.)

4. Influence of insurance industry affecting parent interest in reduced premiums.

5. Competition for student time and interest vis-á-vis the academic program which is already overloaded without driver education.

6. The costs of driver education competing with other school costs at a time when school budgets are straining to sustain formal education programs.

7. Sincere wish on the part of board members to fill a social need, particularly in the direction of safety, if no other agency is filling the need.

8. Unwillingness on the part of some board members to accept driver education as a function of the public schools, as distinct from other agencies, such as police, highway department, or motor vehicle department.

Dr. Marland urged that sound evidence be developed by the members and participants in the symposium, to provide more useful assessment of driver education. *At this time, we offer driver education because it sounds good and feels good. Increasing pressure for accountability by the schools demands that we know just how good it is.*

THE CASE FOR MULTIPLE STANDARDS IN DRIVER TRAINING

Warren E. Rumsfield, past-President
National Professional Driver Education Association

Mr. Rumsfield graduated from Roosevelt University with a degree in education and psychology. His post graduate education included courses at Chicago Teachers College and Iowa State University.

During the years 1951-1957, Mr. Rumsfield was employed as a teacher by the Chicago Board of Education. He founded his own North Shore Driving School as a sideline in the early spring of 1953. By 1957, since North Shore Driving School required all his time and attention, he resigned from his teaching position in the Chicago public schools. By the summer of 1958, the North Shore Driving School had grown into one of the largest organizations of its kind in the country, employing more than 45 people and capable of teaching almost 7,000 people a year to drive. The school now employs up to 85 people and is able to teach up to 15,000 a year.

Mr. Rumsfield started the organizational movement of the driving school industry in the summer of 1958. On October 27-28, 1958, the first national meeting of driving school owners was held in Chicago. The association was called The National Association of Driving Schools, Inc., but this was changed to the National Professional Driver Education Association, Inc. In its first year, the National Association was supported by funds and personnel provided by the North Shore Driving School. Mr. Rumsfield retired as Chairman of the Board of the NPDEA in 1966, but retains a lifetime seat on the Board as the founder of the organization. He has most recently filled the role of chairman of several national committees and was President of the Illinois Association.

On August 15, 1909, the first driver training school in America was established in Springfield, Mass. Mr. A. I. Fairbanks was the proprietor, and rather than being called a driving school, it was called "Practical Auto Instructors." This school is still functioning today and is owned by the widow of its founder.

In the years that followed, many additional "Practical Auto Instructors" established small firms in various parts of the nation through which the proud possessor of a new motorcar could learn to operate the vehicle. No doubt, the earliest driver training schools stressed the actual technical operation of the vehicle and a few points regarding its maintenance. But little by little, these "Practical Auto Instructors" came to see that they would also have to show the new driver how to avoid becoming involved in traffic accidents. And so these "Practical Auto Instructors" set out to develop practical ways of avoiding accidents and practical ways of teaching the technique to their customers whom they soon started to refer to as "students."

The Practical Driving Schools started to multiply and prosper. The ambitious and successful proprietors were quick to recognize the rules of the free enterprise system which dictate that if one can do a good job he can charge a good fee and can show a good profit, and that the business will grow if most customers will send their friends. Thus, some of the schools became greatly concerned with developing a favorable reputation and a good image which would strengthen their firm and enhance their future. Unfortunately, there were (as in all professions, trades, and businesses) a few who lacked the ability, the dedication, the character, or the stature to recognize and meet their obligations to the public. These few, just as in many lines of endeavor, have caused much harm to the reputation of the driver training school industry and embarrassment to the better operators. People, it seems, are always quick to remember and report the bad, but that which is done well is often taken for granted.

In 1958, a National Association was organized which attempted to bring together the more dedicated and conscientious driving school owners and to establish communications with the few local associations which had been started in the previous decade. In the '50s it was found that the driver training school industry in the United States consisted of a little under 2,000 driver training schools which taught perhaps a little over 1,000,000 people to drive a year. Under the guidance of the National Association the number of customers coming to driver training schools increased to about 1,750,000 or more per year. Although the number of schools has increased only to approximately 2,200, both the size and the quality of these schools has been greatly improved. Some of the less desirable schools have been replaced with the more dedicated operators, but we freely admit that considerable work remains to be done in this realm. However, thanks to efforts towards standardization, a better public image, strong driving school laws, and effective nationwide leadership, the driver training school industry has prospered in the last half-decade as never before.

Through the years, the driver training school industry enjoyed the advantages of the free enterprise system. Under the free enterprise system, the driver training schools had a free hand in designing their courses of instruction, in purchasing their equipment, and in establishing the services they would offer to the public. The limitations were only two-fold: First, they had to meet the requirements of general and driving school laws, and secondly, they had to meet the requirements of the customer well enough so that the customer would be likely to refer his friends and relatives to the school. If a particular driver training school felt it would be advantageous to offer instruction in very expensive air-conditioned cars, it would easily do so provided the public was willing to spend an extra fifty cents or dollar for each lesson in the expensive air-conditioned luxury cars. If a driver training school decided to offer a course of fifteen hours of instruction behind-the-wheel rather than ten hours of instruction behind-the-wheel, it could do so provided the public was willing to accept the longer and, of course, more expensive course not only when they personally enrolled for instruction, but also when the time came to make a recommendation to their friends or relatives regarding a source of instruction. Bear in mind that through the last 60 years the driver training school has been highly dependent upon referral business from the friends and relatives of the customers whom they have taught to drive. Until recently the driver training schools' advertising was very passive, limited mostly to announcements in the yellow pages of the telephone directory. Thus, when a person decided that he wanted driving lessons, he would turn to his friends and relatives to inquire about a source for these lessons. And so, just like the local doctor or lawyer, the referral of customers by satisfied students was almost the only practical way a school could grow substantially. Only in the last three or four years has one noticed driver training schools' advertising in newspapers, on billboards, in public transit vehicles, on matchbooks, on radio, etc. Thus it was a matter of doing the job to the satisfaction of the customer--no, to the exuberant satisfaction of the customer--or else facing stagnation or business failure. The practical school owners knew that they had better make a good driver out of the individual and he'd better not have a lot of accidents or he would become a negative influence in the growth and development of the firm. All businessmen know that it takes a hundred delighted customers to equal the ill-effects of one unsatisfied customer. In recent years the questionable operators who failed to learn this lesson were often soon looking for another field in which to make a living.

In order to improve the standards of the industry and to curb the flow of questionable operators, the driver training school industry itself designed and lobbied for strong and effective driver training school laws in each state. Thanks to this effort at least 37 states now have driver training school laws most of which are based, at least in part, upon the national recommendations. And Federal legislation for which leaders of the driver school training industry also fought, provides that the states must regulate driver training schools or suffer financial losses from their Federal highway funds.

Being practical teachers of driving, the driver training schools are concerned with only one thing: Teaching people how to move a vehicle from one point to another without becoming involved in collisions with other vehicles, or with pedestrians, or with fixed objects. There is no great concern for developing the soul of the individual so that he is likely to be a superior citizen, or so that he is likely to be a moral individual, or so that he is likely to earn a seat in heaven. The practical instructors are concerned about the practical problem of teaching people to move a car safely from one point to another. This, it seemed to them, was the function of driver training.

A philosophy was started, therefore, based upon habit-building. The driver training schools set out to develop skill and safe driving habits. They feel that their ability to employ teachers who do not get bored because they are overly educated is a strong, positive asset. They see where their ability to allow for individual differences between students makes it possible to meet the needs of each student on an individual basis. They question the value of five times as much classroom work as behind-the-wheel work for beginning drivers. They borrowed the basic concepts developed by Harold L. Smith as part of their philosophy of driver training. As most experts know, Harold Smith has developed a successful technique of safe driving which he uses in the retraining of experienced fleet, truck, and passenger car drivers for large commercial firms. Many driver training schools have applied these same concepts to the training of new drivers. Time and space does not allow us to go into all details regarding the "Smith System" here. But it is hoped that those who are not familiar with the Smith System will avail themselves of information on the topic.

The experts in the profession were quick to recognize that the habit-building philosophy based upon the ideas of Harold L. Smith was probably the best approach to creating safe new drivers. Of course, they lack scientific studies to prove what their eyes and hearts know to be true. But then, the advocates of all other philosophies of driver training also lack valid studies. All are in the same boat, and all are more or less starting from scratch.

The professional driving school industry is proud of its sweeping reforms and improvements of the last 10 years. But the leaders of the industry admit freely that much work remains to be done. To those who accuse the professional driving school of shortcomings, they plead "guilty" in many cases. But in their plea of guilty they say to all involved in traffic safety, "You must share the guilt. Where were you when the driving school needed guidance, leadership, and regulatory legislation?"

The accomplishments of the last 10 years are even more astonishing when one realizes that not only was there often undermining and opposition to their efforts to get effective driving school regulatory legislation but sometimes the schools had to, at the same time, fight against hostile or ruinous legislation. A million or more people were coming to driving schools a year, and nearly all of traffic safety either ignored them, or opposed their efforts to put their own house in order, or pushed injurious and unfair legislation at them.

Recently, we have heard a neat slogan called "The Single Standard" applied to driver education. Apparently, those interested in high school driver education desire to force the professional driving schools to accept and employ their standards and their philosophies. By calling for a "single standard" they are in effect saying "We want you to do things our way."

In view of the failures and shortcomings of high school driver education, one might consider this proposition to be a little humorous. But the humor ends when we find these people actively lobbying in Washington and in the state capitols to force, indeed, their strange philosophy upon their competitors in the professional driving school field. In view of this it behooves us to take a close, critical look at the "single standard" which is being advocated and to compare it with other standards which may exist.

Often the professional driving schools have the job of correcting and completing the instruction of the children who have already had a 30 and 6 course in the high schools. One Chicago professional school alone processed 155 high school driver education graduates in one month of 1968. Multiply this figure by the total number of driving schools, and one can recognize that a tremendous number of high school trained teenagers appear at professional schools for further instruction. Through this, and by taking college driver education courses, etc., the practical schools became thoroughly familiar with the theory, practices, and product of the high schools. And frankly, most are a bit contemptuous of it. And so it has been that the practical school operator sought a different philosophy and approach to the topic of creating safe new drivers. Perhaps he's not always positive that the approach he is contemplating is absolutely the best one, but he says that he at least knows one approach which is wrong.

The 30 and 6 attitude-building concept of driver education was developed 34 years ago. Probably, the course, consisting of five times as much classroom instruction as behind-the-wheel instruction, was produced because it seemed to be the easiest thing to schedule at the time, because it was a salable size package, and because it seemed economically feasible. After all, it is far less expensive to conduct 30 hours of classroom instruction than several hours of behind-the-wheel instruction. This is dramatically illustrated in Illinois, for example, where the state allocates only $8.00 of public funds for the 30 hours of classroom instruction for teenagers but allocates $32.00 of public funds for six hours of behind-the-wheel instruction.

But the professional driving schools don't have budget committees to convince, schoolboards to bulldoze, or taxpayers to appease. They are free of these things and can design instruction, not simply to be a salable package to the schoolboards and budget committees, but actually to do a job. Think of it, a driving course with none of the hamstrings that saddle high school driver education! Possibilities unlimited! This is the reason why the driving schools should be able to blaze a great trail. They are free to explore, to seek better methods, to find new horizons. Of course there are those who would straightjacket the professional driving schools with the same 30 and 6 courses and methods that hold back the high schools. This must never be allowed. Traffic safety should make use of the miraculous potential of the free enterprise driving schools. Use the system that in all other areas has made America great!

Following the adoption of the 30 and 6 concept of driver education, various rationales were developed to justify such a program. Attitude-building was more important than habit-building, claimed the advocates of this program. We all know that good attitudes can be just as well "taught" in a classroom as behind-the-wheel. Thus, a hodgepodge of theories and hypotheses developed in order to sell this concept first to those who were to become its promoters and secondly to the schoolboards, educators, legislators, and the public, and a host of statistics flooded the nation claiming that this driver education program reduced accidents by 50%. Can you imagine; 36 hours of instruction and the results are a 50% reduction in accidents on the part of thoughtless, immature, accident-prone teenagers? Sounds fantastic, doesn't it? As revealed by the researchers in the symposium held at the Drake-Oakbrook Motel in Oakbrook, Illinois, December 1-4, 1968, this concept was indeed fantastic, since it was amply pointed out that there are no data or statistics which prove conclusively that high school driver education has any beneficial effects whatsoever.

Even further than that, the professional schools viewed, first with amusement, later with horror, the attitudes towards such devices as driving ranges and simulators. Simulators are a cheap substitute for the real thing and designed primarily to save money; however, as time went on, simulators became not simply a money-saving device but a superior standard all by themselves. There was something about simulators that made them better than the real thing which they were supposed to imitate, or so it seemed some people believed. And even the driving ranges which were designed to substitute for actual on-the-road and in-traffic coach-pupil instruction soon started to take on an air of superiority over actual coach-pupil in-traffic instruction. The professional schools which had the job of correcting and completing the instruction of teenagers were not deceived; they viewed the quality of instruction in the high schools as going down, not up, as a result of the money-saving devices. Even today, there is an incredibly strange outlook with regard to these devices because some people actually believe that they are superior to the real thing which they are supposed to imitate.

In explaining the difference between high school driver education and that which the professional driving schools do, I can find no better reference than some selected quotations from what is really the first nation-wide study of "the state of the art," which was published in 1962 after an exhaustive two-year study. This is reported in a book entitled The Highway Jungle , written by the late Dr. Edward Tenney. Tenney explains the difference between driver education and driver training, and implies that the professional schools are the ones doing driver training and the high schools are the ones interested in driver education. We think he has hit the nail nearly on the head and would like to quote some of his comments at this time.

> *Most citizens are confused over the difference in the meaning of the terms "driver education" and "driver training". If asked to distinguish between a high school educated driver and a professionally trained one, many would stutter, then say that they saw no difference. Journalists and radio announcers use the two words in the same report as if they meant the same thing. In consequence, the citizens, whether they act in their capacity as parents of adolescents or as legislators, city, state, or federal, or as members of boards of education, usually vote in ignorance on the supposition that a vote for driver education is a vote for driver training. Yet the two differ fundamentally in*

method and in teaching. Although both aim at the same target, their methods for scoring bull's eyes differ as shooting a machine gun differs from shooting a telescopic rifle. In the first you spray the target and hope for a hit; in the second you focus the cross hairs and center the shot.

High School Driver Education is spiritual, theoretical, complex, academic and begins with the assumption that the student is ignorant of cars, traffic problems, and human nature.

Professional Driver Training, physical, practical, unacademic, begins with the assumption that the student already knows much and should be trained or "habituated" to use that much well.

High school driver education is based on the theory that good people don't have accidents and that bad people do. It is what is called an ethical or moral science. Accidents are caused by bad people being bad, and safety is created by good people being good. Those who have right attitudes live safely and usually die of old age; those with wrong attitudes live recklessly and often die prematurely. A few accidents are unavoidable, as when an avalanche sweeps skiers into a canyon, but 80 or 90 per cent of what are called accidents allegedly stem from wrong attitudes. A scientific study of these wrong attitudes reveals the right ones, and all that remains to be done is to cultivate these . . . . Safe driving allegedly illustrates a person's charity, benevolence, and good will toward everybody. It represents the high-water mark of civilization, for it symbolizes the co-operative, non-competitive spirit. A spiritually educated driver never contests the right of way but yields it humbly. A good teacher can so humiliate a youth in thirty class recitations plus six hours of illustrative practice as to render him "safe" thereafter. The primary problem is a problem of soul, of right attitude.

By contrast, driver training aims at no such ethereal culmination. It is a practical science and has one clearly limited purpose: the safe transportation of man and materials from one spot to another. Its aim is to train the eye to see the whole traffic picture, to discipline the hand *to steer and the foot to accelerate, decelerate, and brake as the traffic picture opens up or closes in. Thus the taxi driver who delivers his load as required by this small science is not to be praised for his virtue and civic nobility, but for doing his little job scientifically. The problem is regarded by the driver trainer as a problem not of soul, but of sense. The right use of the five senses, particularly the sense of eyesight, suffices; the sixth or soulful sense may be a wonderful thing to have, but many "safe" drivers don't have it.*

A second general difference is in method. The science of driver education uses the indirect approach on the theory that the safety soul-set cannot be developed directly. The official doctrine as established at the Jackson's Mills (West Virginia) conference in 1949 lists five approaches, four of them indirect: The student is made "safe" by --

1. *Developing "a strong sense of personal and social responsibility for the common welfare"*
2. *Developing "pride in maintaining high standards of performance"*
3. *Promoting "the safe, efficient, and enjoyable use of equipment and environment"*
4. *Promoting "habits of co-operation in meeting problems of the common welfare"*
5. *Preparing himself for a "socially useful" job*

All of these main purposes have two or more sub-purposes listed. Thus the fifth sub-purpose of number 1 is to develop "a thinking in working toward a solution of the traffic problem". When the sub-purposes are added to the major ones, the teacher and student are confronted with the problem of achieving twenty-three sublime and useful purposes in thirty-six lessons, one of which is the development of "a dynamic realistic philosophy".

The science of driver training is completely unphilosophical. It limits itself to the fifth purpose -- that of doing a job well. In fact, the science doesn't speak of "socially useful" jobs, because few drivers can judge whether they are doing what is socially useful; hence a job is simply called a job. The approach is direct. It begins not in academic theory but with the right use of the physical eye. Among the purposes of the driver trainer are these five to train a student:

1. To aim high in steering
2. To get the big traffic picture
3. To keep his eyes moving
4. To leave himself an "out"
5. To make sure he is seen

A third major difference is in the attitude of the teacher toward the student. The driver educator starts with the assumption that the student knows nothing and therefore must have everything spelled out for him.

Two social sciences, psychology and sociology, are supposed to be the sciences which will solve the accident problem so that "we will not be in constant danger of destroying one another". By an academic study of the psychological and sociological foundations of accident causation, a boy or girl is allegedly immunized against avoidable accidents. This socio-psycho knowledge will drive out the evil attitudes and infuse the charitable ones.

The driver trainer disagrees sharply. Well-intentioned people experience grief on the highway all the time. According to one report, 85 percent of all accidents happen to the best people, to citizens who love their wives, adore their children, and yearn for the common welfare. So the driver trainer begins his teaching about where the driver educator ends his. The driver trainer makes the primary assumption that his trainee was not born yesterday but has learned from the greatest of teachers, experience, that we do have a traffic problem, that cars have internal-combustion engines, that laws govern the use of cars on public roads, that cars must be jacked up before changing tires, that the panel has gauges which tell the driver various stories, and that two solid bodies cannot occupy the same space simultaneously. The driver trainer assumes that every boy and girl knows Newton's Laws of Motion, not necessarily in theory but simply through the experience gained in childhood from falling off tricycles and bicycles and from running around corners . . . . In other words, a driver trainer believes that what a student and his parents can readily do for themselves they should do, and that the superficial, the trivial, the self-evident, and the irrelevant should be omitted. Good driving is a matter not of how maladjusted other people are nor of the sociology of mass production, but of what you do with your eyes and feet as the traffic picture unwinds before you.

The driver trainer leans heavily on the fact that good driving is a matter of small intelligence and much training. Thousands and thousands of excellent chauffeurs, bus drivers, taxi men and women, and truckdrivers for commercial fleets roll up remarkable records -- the best in the country -- without benefit of the higher sociological and psychological science, often without high school diplomas, some even without average intelligence.

. . . Among the best drivers in America are James Hoffa's Teamsters. Case studies of the rank and file membership of this extensive union reveal no superior ethical excellence. This group of more than a million shows no signs of an intense desire to ennoble itself by inward purgation. The group is not distinguished for its civic virtue, nor does the country look to it for leadership. If civic virtue is the basis of good driving, then the best drivers surely must have the highest civic virtue. Few citizens outside the Teamsters' Union would make this claim for it. And thus the driver trainers roundly assert that skillful driving has no visible relationship to civic virtue. Bad citizens often drive well and good citizens often drive badly; no citizen should be licensed to drive merely because he has the safety soul-set . . .

. . . . At a meeting in 1949, the educators ruled that thirty hours of theory are needed to produce the right attitude and that six hours of practicing it behind the wheel will suffice. Out of this group agreement has come the standard thirty-and-six ruling *which legislatures have written into state laws. Hence, according to some laws, the school guarantees to the state that the applicant for a driver's license has the right attitude, and is "safe", because he has a certificate from the school proving he has passed the 30 and 6 course of study.*

The trainer puts his emphasis not on any particular number of hours of theoretical study. People differ so markedly in their powers of observation that one person may need a hundred hours of training before he habitually sees the whole traffic picture and responds to it accurately; twenty hours may suffice for another; a thousand may do a third scant good. The whole idea of some fixed schedule is, to a trainer, absurd . . . .

. . . . To a citizen who compares the results of these two approaches, the case for the trainer looks strong. In an academic environment, intelligence is at a premium; but in a congested stream of fast-flowing traffic THE TRAINED EYE and THE TUTORED FOOT count most heavily. Hence a trained taxi man or bus driver, even if a high-class moron, does his job deftly day in and day out. He may be unable to extract the square root of 4, but he sees the whole traffic picture. He "co-operates" not from love of the common welfare but from habit.

Since the accident rates of trained drivers are superior to those of educated drivers, a citizen may infer that training is superior to educating. If a citizen lives in a community where the other citizens insist that the local school assume the responsibility for immunizing their children against auto accidents, then that citizen may reasonably request that the school give thirty hours of training on the road behind the wheel and six hours of educating in the classroom. Common sense supports the stand of the driver trainer who said, "Six hours of training behind the wheel is just enough to teach a child to drive dangerously". The statistics seem to confirm this judgment. If the school is going to assume responsibility, let it really assume the full load and give training commensurate with the danger. If an average of fifty hours is needed, then fifty hours should be given. To do otherwise would be unethical and wicked; for when the school assumes the responsibility, it ought to be held responsible for the results. When the school says

> *to the citizen, "We will safety-proof your child", the citizen has the right to say to the school, "Be sure you do."* [1]

The professional driving schools are confident that future evidence will show the superiority of their practical approach. In view of the fact that there is no evidence to prove any degree of effectiveness in the philosophies of those who preach otherwise, we insist upon the right to use our own philosophy in the teaching of our students, teenagers, and adults.

Indeed, "double standards," if you please. . . . . . Unless, of course, others would care to adopt our standards now rather than a few years from now.

We hope that these remarks can be taken without malice or hard feelings. There are things that we would rather not have pointed out. But the recent ridiculous drive for a "single standard" on the part of those who would force the driving schools to accept someone else's outlook has made it necessary to question the merits of the single standard to which we all are supposed to submit.

Let the professional driving schools go their way and operate under their own philosophies and let all others do the same. Let the net results eight or nine years from now, when valid statistics will be available, speak for each philosophy. Indeed, there may be several philosophies or standards which should be explored or tried out. Perhaps there are those within the professional driver training school field or elsewhere who have still a third or a fourth approach to the problem of creating safe drivers. So long as no group has evidence that its system is producing effective results, who is entitled to say that one system is superior to another? . . . . . or that any system does not merit at least a fair trial?

You may be shocked to think that several groups would be experimenting upon the public to find the best means of creating safe drivers. But after all, we have just witnessed a 34-year experiment which was performed upon millions of teenage boys and girls and which ended in failure.

The case for multiple standards is as simple as this: So long as we have one set of standards which is failing, we'd be rather foolish to put all our eggs in this one basket. The best way to find a system which will produce safe drivers is to explore as many avenues as possible. And who is to deny that perhaps the professional driving schools are on the right track? Certainly not those who are themselves on the wrong track.

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[1] *Tenney, Edward, The Highway Jungle. New York: Exposition Press, 1962, pp. 68-75.*

It now behooves everyone interested in traffic safety to seek ways and means to create safe and efficient new drivers. Every hand is needed, and only the philosophies and approaches which have already been proven erroneous should be rejected. Our colleagues in the high schools, if they are indeed to meet their obligations to humanity, now face the Herculean task of completely overhauling their approach to the driver education problem. Lord knows if they can ever turn their techniques into something which will do an effective job in creating safe new drivers.

The professional schools are firmly convinced that they have the best possible solution to the problem of creating safe new drivers through their habit-building philosophy.

All of us ask only for the opportunity to serve and to prove that we can indeed do an effective job in reducing highway deaths and injuries . . ... and spare us from the "single standard" nonsense.

THE MISSION, OBJECTIVES, ORGANIZATION, AND PROGRAMS OF THE NATIONAL HIGHWAY SAFETY BUREAU

William E. Tarrants, Director
Office of Safety Manpower Development
National Highway Safety Institute
National Highway Safety Bureau

Dr. Tarrants is a graduate of the Ohio State University where he received the degrees of Bachelor of Industrial Engineering and Master of Science in Industrial Engineering. He earned the Doctor of Philosophy degree in education at New York University.

He formerly held the position of instructor in industrial engineering at the Ohio State University. From 1959 to 1964, Dr. Tarrants served as Assistant Professor and Research Associate at the Center for Safety Education, New York University. From 1964 to 1967, he served as Chief, Division of Accident Research, Bureau of Labor Statistics, U.S. Department of Labor, with primary responsibility for conducting special studies of injury rates and accident causes in selected high-hazard industries throughout the United States. Since May, 1967, Dr. Tarrants has been Acting Director, Office of Safety Manpower Development, National Highway Safety Bureau, U.S. Department of Transportation. He is responsible for planning and administering activities designed to increase the supply and improve the skills of all classes of manpower required to implement effective highway and traffic safety programs at the Federal, state, and local levels throughout the United States.

Dr. Tarrants is a member of the American Society of Safety Engineers, the American Institute of Industrial Engineers, the Human Factors Society, the System Safety Society, and the American Association for the Advancement of Science. He serves on a number of national committees in the fields of safety engineering, traffic safety, standards development, education, and research. He has published over twenty articles on various subjects in safety and related fields and holds licenses in two states as a registered professional engineer.

I welcome this opportunity to describe the mission, objectives, organization, and some of the programs of the National Highway Safety Bureau.

RELEVANT CONSIDERATIONS & CONSTRAINTS:

- IMPACT ON TRANSPORTATION SYSTEM
- IMPACT ON INDUSTRY (MANUFACTURERS, DEALERS, INSURANCE, STEEL, OIL, ETC.)
- FEDERAL - STATE - LOCAL RELATIONSHIPS
- PUBLIC & PRIVATE COSTS
- SOCIAL CONSIDERATIONS
- INTERNATIONAL TRADE

THESE MAY AFFECT TIMING AND DETAILS OF SAFETY PROGRAM

Fig. 1. Nature of the problem.

Our challenge is to achieve highway safety gains with due consideration to such relevant considerations and constraints as the impact of the program on the transportation system, program impact on industry (manufacturers, dealers, insurance, steel, oil, etc.), Federal-state-local relationships, public and private costs, social considerations, and international trade.

These and other factors may affect timing and details of implementation -- but cannot be allowed to impede our basic objectives.

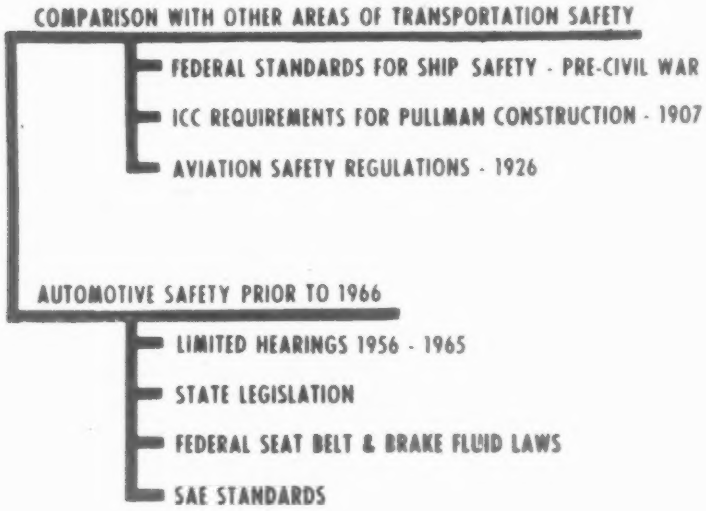

COMPARISON WITH OTHER AREAS OF TRANSPORTATION SAFETY
FEDERAL STANDARDS FOR SHIP SAFETY - PRE-CIVIL WAR
ICC REQUIREMENTS FOR PULLMAN CONSTRUCTION - 1907
AVIATION SAFETY REGULATIONS - 1926
AUTOMOTIVE SAFETY PRIOR TO 1966
LIMITED HEARINGS 1956 - 1965
STATE LEGISLATION
FEDERAL SEAT BELT & BRAKE FLUID LAWS
SAE STANDARDS

Fig. 2. Legislative background.

A comparison with other areas of transportation reveals that Federal legislative programs regulating safety have been in existence for a number of years. Federal standards for ship safety predate the Civil War. The Interstate Commerce Commission established safety requirements for Pullman construction as early as 1907. Aviation safety regulations were adopted in 1926.

An examination of the history of automotive safety prior to 1966 reveals that limited hearings were conducted by House and Senate Subcommittees and investigative groups during the period 1956 to 1965. In 1956, a Special Subcommittee on Traffic Safety of the House Committee on Interstate and

Foreign Commerce conducted hearings on traffic safety. During 1957 and 1958, Subcommittees of the House Committee on Interstate and Foreign Commerce held hearings on automobile seat belts, interstate compacts for traffic safety, and research needs in traffic safety. In 1959, the House Committee on Public Works explored the Federal role in traffic safety. During the period from 1959 through 1963, Subcommittees of the House Committee on Interstate and Foreign Commerce held hearings on motor vehicle safety, register of automobile license revocations, motor vehicle safety standards, the establishment of a National Accident Prevention Center, and automobile seat belt standards. In 1965 the Senate Committee on Commerce conducted hearings on tire safety. The Federal role in traffic safety was again examined in 1965 and 1966, this time by the Subcommittee on Executive Reorganization of the Senate Committee on Government Operation.

During this same time period, certain state legislatures passed laws pertaining to seat belts, brake fluid, and state motor vehicle inspection programs. Federal laws followed state laws on seat belts and brake fluid. In addition, various voluntary standards on automotive safety were developed and published by the Society of Automotive Engineers.

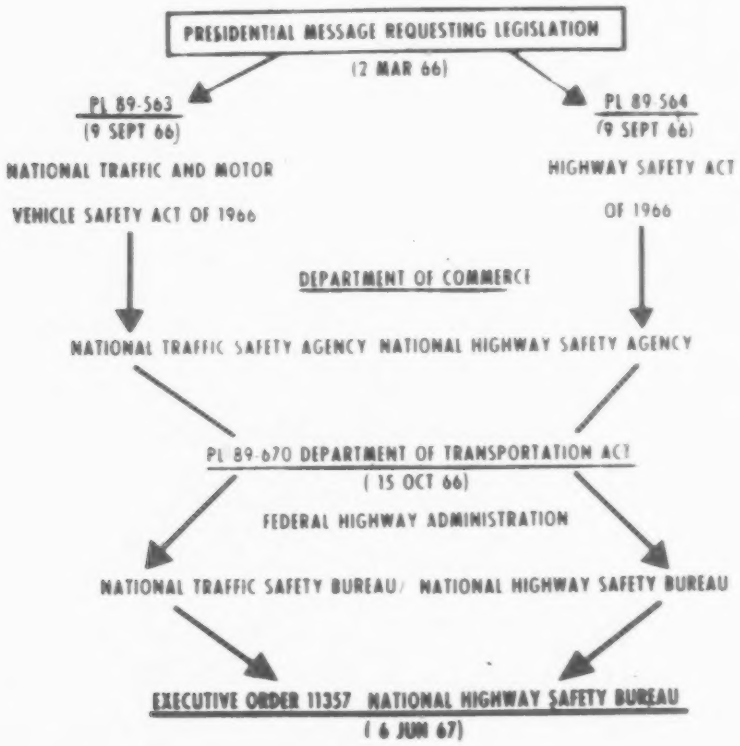

PRESIDENTIAL MESSAGE REQUESTING LEGISLATION
(2 MAR 66)
PL 89-563
(9 SEPT 66)
NATIONAL TRAFFIC AND MOTOR VEHICLE SAFETY ACT OF 1966
PL 89-564
(9 SEPT 66)
HIGHWAY SAFETY ACT OF 1966
DEPARTMENT OF COMMERCE
NATIONAL TRAFFIC SAFETY AGENCY
NATIONAL HIGHWAY SAFETY AGENCY
PL 89-670 DEPARTMENT OF TRANSPORTATION ACT
(15 OCT 66)
FEDERAL HIGHWAY ADMINISTRATION
NATIONAL TRAFFIC SAFETY BUREAU/
NATIONAL HIGHWAY SAFETY BUREAU
EXECUTIVE ORDER 11357 NATIONAL HIGHWAY SAFETY BUREAU
(6 JUN 67)

Fig. 3. Presidential Message Requesting Legislation (chronology of events).

During 1966, both executive and legislative activities in the field of highway and traffic safety were intensified. This chart contains a chronological summary of the major executive and legislative actions affecting the national highway and traffic safety program. As a result of President Johnson's message requesting legislation presented to the Congress on March 2, 1966, two laws were passed: The National Traffic and Motor Vehicle Safety Act of 1966 (Public Law 89-563, dated 9 September, 1966) and the Highway Safety Act of 1966 (Public Law 89-564, dated 9 September, 1966). The first law established the National Traffic Safety Agency and the second established the National Highway Safety Agency, both within the Department of Commerce. With passage of the Department of Transportation Act (Public Law 89-670) on October 15, 1966, the newly designated National Traffic Safety Bureau and the National Highway Safety Bureau were placed under the Federal Highway Administration within the Department of Transportation. Finally, On June 6, 1967, Executive Order 11357 issued by President Johnson combined the two Bureaus under the single title of the National Highway Safety Bureau located within the Federal Highway Administration of the United States Department of Transportation where it remains today.

NATIONAL TRAFFIC AND MOTOR VEHICLE SAFETY ACT

TITLE I
- ESTABLISH APPROPRIATE "FEDERAL MOTOR VEHICLE SAFETY STANDARDS"
- STANDARDS ARE TO BE
  - PRACTICAL
  - OBJECTIVE
  - NEEDED FOR SAFETY
- CONDUCT RESEARCH, TESTING, DEVELOPMENT AND TRAINING
- ADVISE, ASSIST AND COOPERATE WITH PUBLIC & PRIVATE ORGANIZATIONS
- ENFORCE STANDARDS
- DEFECT NOTIFICATION

TITLE II
- TIRE SAFETY STANDARDS AND LABELING

TITLE III
- ACCIDENT AND INJURY RESEARCH AND TEST FACILITY

TITLE IV
- NATIONAL DRIVER REGISTER

HIGHWAY SAFETY ACT

- STATE HIGHWAY SAFETY PROGRAMS
- UNIFORM PROGRAM STANDARDS
- GOVERNOR IS RESPONSIBLE
- LOCAL INVOLVEMENT
- MATCHING FUNDS

HIGHWAY SAFETY RESEARCH AND DEVELOPMENT

Fig. 4. Summary of major areas of responsibility.

Specific task assignments and major areas of responsibility have been established by the National Traffic and Motor Vehicle Safety Act and by the Highway Safety Act. Title I of the National Traffic and Motor Vehicle Safety Act establishes appropriate "Federal motor vehicle safety standards." It requires the Secretary to conduct research, testing, development, and training necessary to carry out the objectives of this title. It authorizes the Secretary to advise, assist, and cooperate with public and private organizations in the planning and development of motor vehicle safety standards and methods for inspecting and testing to determine compliance with these standards. It contains provisions for enforcing the standards, including penalty provisions for noncompliance. For example, the law [on motor vehicle standards] shall be subject to a civil penalty of not to exceed $1,000 for each such violation." It further provides that "such violation of a provision of section 108 or regulations issued thereunder, shall constitute a separate violation with respect to each motor vehicle or item of motor vehicle equipment or with respect to each failure or refusal to allow or perform an act required thereby, except that the maximum civil penalty shall not exceed $400,000 for any related series of violations." The law under Title I also provides that "every manufacturer shall furnish notification of any defect in any motor vehicle or motor vehicle equipment produced by such manufacturer which he determines, in good faith, relates to motor vehicle safety, to the purchaser of such motor vehicle or motor vehicle equipment, within a reasonable time after the manufacturer has discovered such defect."

Title II of the Act contains provisions that pneumatic tires will be permanently and conspicuously labeled with certain safety information. It further provides for the establishment of tire safety standards, including a uniform quality grading system for automobile tires.

Title III authorizes the Secretary to make a complete investigation and study of the need for a facility to conduct research, development, and testing in traffic safety (including motor vehicle and highway safety) and in connection with maintenance on highways.

Title IV of the Act provides for a national driver register identifying individuals whose license or privilege to operate a motor vehicle has been denied, terminated, or temporarily withdrawn by a state or a political subdivision of a state.

The Highway Safety Act of 1966 provides that each state shall have a highway safety program, approved by the Secretary, designed to reduce traffic accidents and deaths, injuries, and property damage resulting from them. It provides that these programs shall be established in accordance with uniform standards developed by the Secretary and that they shall be expressed in terms of performance criteria. The Act states that the Secretary shall not approve any state highway safety program which does not:

1. Provide that the governor of the state shall be responsible for the administration of the program.
2. Authorize political subdivisions of the states to carry out local highway safety programs within their jurisdictions as a part of the state highway safety program.
3. Provide that at least 40 percent of the Federal funds apportioned to a state will be expended by the political subdivisions of the state in carrying out local highway safety programs.

A total of 75 percent of the highway safety funds are apportioned to the states according to population, and 25 percent are apportioned at the discretion of the Secretary of Transportation. All Federal funds assigned to a state under section 402 of this Act must be matched by state appropriations, and the aggregate fiscal expenditure in a state must at least equal the average of its fiscal 1965 and 1966 aggregate expenditures.

Section 403 of the Highway Safety Act establishes a highway safety research and manpower development program. Under the provisions of this section, the Secretary is authorized to use appropriated funds to carry out safety research, to provide grants for training or education of highway safety personnel, to establish research fellowships in highway safety, to develop improved accident investigation procedures, to develop emergency service plans, to conduct or sponsor demonstration projects, and to perform related activities deemed necessary to carry out the purposes of the section.

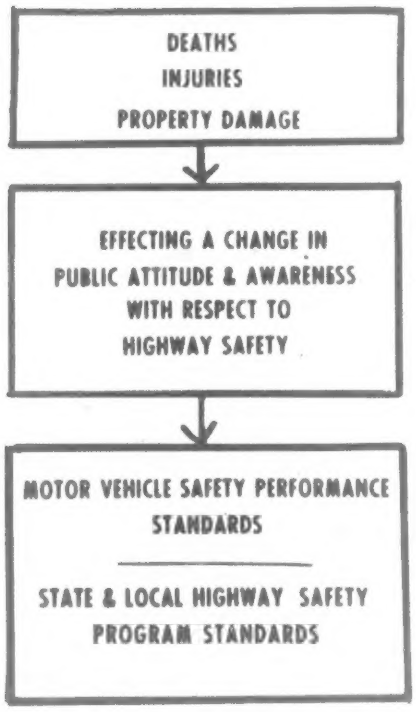

DEATHS
INJURIES
PROPERTY DAMAGE
EFFECTING A CHANGE IN
PUBLIC ATTITUDE & AWARENESS
WITH RESPECT TO
HIGHWAY SAFETY
MOTOR VEHICLE SAFETY PERFORMANCE
STANDARDS
STATE & LOCAL HIGHWAY SAFETY
PROGRAM STANDARDS

Fig. 5. Summary of missions and programs.

Our missions may be summarized as significant reductions in traffic deaths, injuries, and property damage.

We seek to accomplish this by effecting changes in public attitudes and awareness with respect to highway safety. More specifically, our programs culminate in:

- First, motor vehicle safety performance standards that have impact on automobile manufacturers
- Second, standards on such highway safety programs as driver education, motor vehicle inspection, and driver licensing that are carried out by states and local governments.

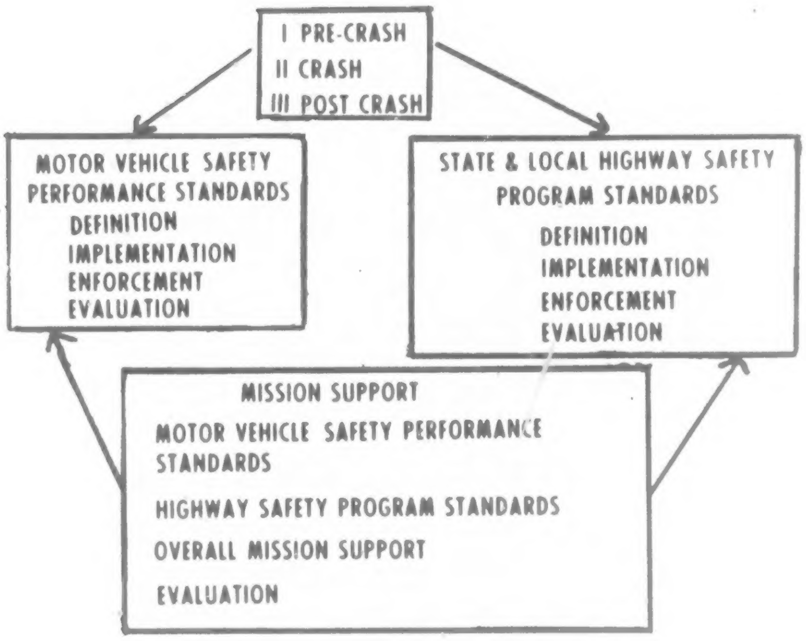

I PRE-CRASH
II CRASH
III POST CRASH
MOTOR VEHICLE SAFETY PERFORMANCE STANDARDS
DEFINITION
IMPLEMENTATION
ENFORCEMENT
EVALUATION
STATE & LOCAL HIGHWAY SAFETY PROGRAM STANDARDS
DEFINITION
IMPLEMENTATION
ENFORCEMENT
EVALUATION
MISSION SUPPORT
MOTOR VEHICLE SAFETY PERFORMANCE STANDARDS
HIGHWAY SAFETY PROGRAM STANDARDS
OVERALL MISSION SUPPORT
EVALUATION

Fig. 6. Summary of missions and programs.

Our approach to the problem of traffic death or injury is to view it as the end result of a three-phase sequence of circumstances or factors.

> Phase One or the "Pre-Crash" phase comprises those factors that lead up to the occurrence of accidents. It is defined as the "initiation" period in a temporal accident sequence which exists prior to a crash or near crash. In it operate such factors as drunken driving and alcoholism; mechanical and medical failures; defects in road design, construction and maintenance; and deficiencies in the handling, braking, and related characteristics of the vehicle. Countermeasures in this phase are aimed at accident avoidance.
>
> Phase Two or the "Crash" phase includes those factors which, during the course of the crash itself produce the bodily damage, that is, injuries or death to occupants. In the crash phase the results of the impact in terms of injury or death are substantially determined by the extent to which

prior provision has been made for rendering the forces involved less abrupt. Here the ability of the vehicle "package" to protect those inside from the forces of the crash largely determines, for most of the accidents now occurring, whether injury will occur and how severe it will be. Countermeasures in this phase are aimed at injury amelioration.

Phase Three or the "Post-Crash" phase refers to the factors which, after the crash, in some fashion militate against the ultimate full recovery from injuries suffered in the crash. In the post-crash phase the factors that largely determine whether the seriously injured will survive, and with what after-effects, are those that relate to the promptness and quality of the first-aid and emergency transportation they receive. Countermeasures in this phase are aimed at producing an effective emergency response and at maximizing salvage.

Organizationally our effort is divided into two missions: the development and implementation of motor vehicle safety performance standards and state and local program standards, each requiring definition, implementation, enforcement, and evaluation actions. These two programs constitute the major thrust of the Bureau's operating effort. In addition, a mission support program has been established to provide research, development, test, evaluation and manpower guidance for the two major services.

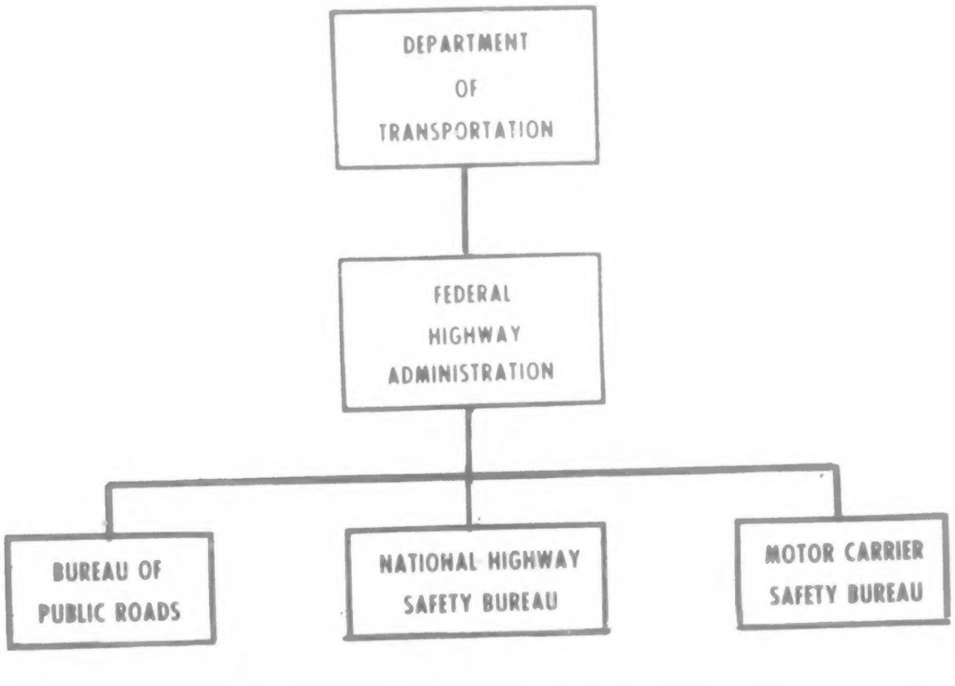


Fig. 7. Organization and responsibilities of the NHSB.

This chart identifies the location of the Bureau within the organizational structure of the Department of Transportation. The National Highway Safety Bureau, along with the Bureau of Public Roads and the Motor Carrier Safety Bureau, is located in the Federal Highway Administration within the Department of Transportation. The Directors of these three Bureaus report to the Federal Highway Administrator, Mr. Lowell K. Bridwell.

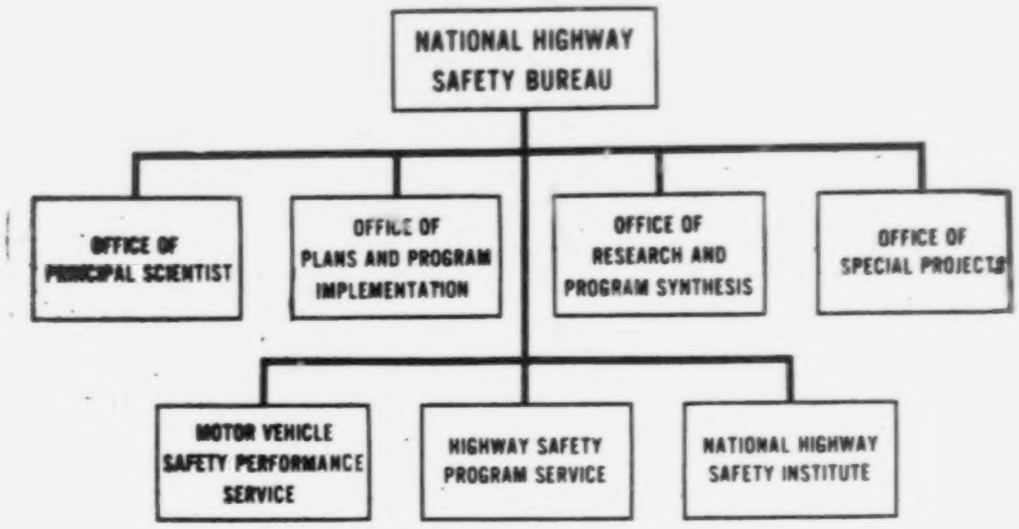

NATIONAL HIGHWAY SAFETY BUREAU
OFFICE OF PRINCIPAL SCIENTIST
OFFICE OF PLANS AND PROGRAM IMPLEMENTATION
OFFICE OF RESEARCH AND PROGRAM SYNTHESIS
OFFICE OF SPECIAL PROJECTS
MOTOR VEHICLE SAFETY PERFORMANCE SERVICE
HIGHWAY SAFETY PROGRAM SERVICE
NATIONAL HIGHWAY SAFETY INSTITUTE

Fig. 8. NHSB overall organization.

A more detailed organizational breakdown of the Bureau is shown here. The three primary line functions are the Motor Vehicle Safety Performance Service, the Highway Safety Programs Service, and the National Highway Safety Institute.

> The Motor Vehicle Safety Performance Service deals with the establishment of motor vehicle performance standards including the development of the engineering information in support of standards, evaluation of compliance by the manufacturers with these standards, and the defects notification program.
>
> The Highway Safety Programs Service is concerned with the development of performance standards for the various state highway safety programs. It

provides assistance to the states in implementing the programs, assists in the performance of the various program areas, assures compliance with the standards as issued by the Secretary, receives and processes 402 matching-fund grant applications from the states, and performs a liaison function with the Bureau's Regional Directors and the State Governors' Representations.

The National Highway Safety Institute serves the other two Services by planning and implementing all of their research, test, development, accident and injury analysis, demonstration, and manpower training projects.

The Office of the Director is concerned with interface with the Federal Highway Administration, development of overall policy direction of programs, coordination with the advisory committees, evaluation of the overall program, and inter- and intra-Bureau coordination of activities and programs. The other four offices identified on this figure report to the Office of the Director.

The Office of Principal Scientist provides scientific advice and consultive services, seeks to broaden the Bureau's base of scientific participation, and establishes liaison with the scientific community. Included among the present positions are scientists in the fields of medicine (e.g., Colonel Stapp), engineering, public health, and mathematics.

The Office of Plans and Program Implementation develops and maintains up-to-date comprehensive program plans, monitors a balanced program, and provides a basis for determining resource requirements and allocations. This office also coordinates the Bureau's budgeting functions.

The Office of Research and Program Synthesis is concerned with identifying the cost/effectiveness of traffic safety techniques, analysis of all research bearing on highway safety, and implementation of newly acquired knowledge.

The Office of Special Projects performs a variety of functions as prescribed by the Bureau Director. This office also serves as the Secretariat for the Bureau's official advisory groups.

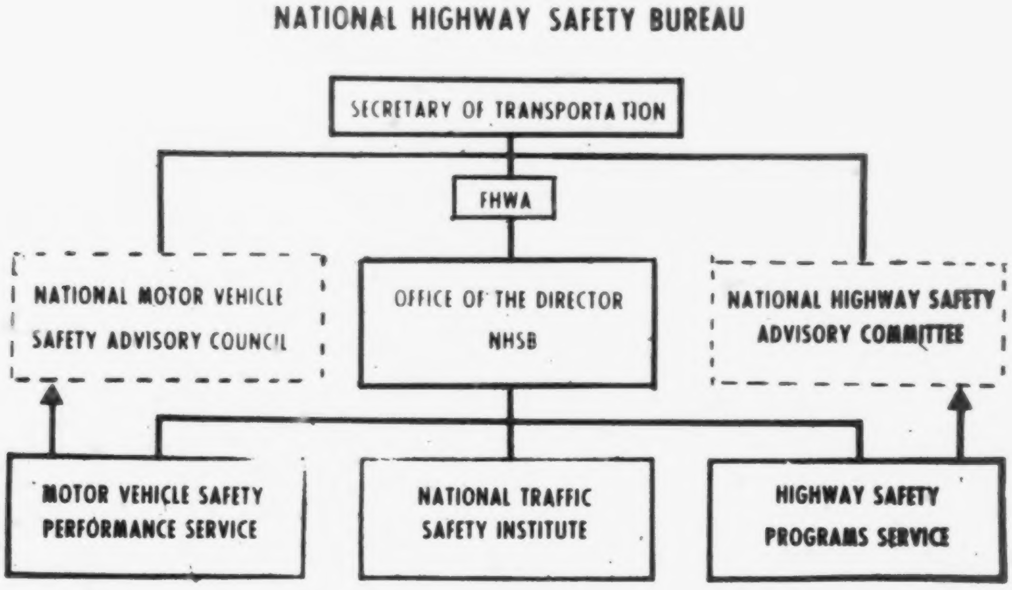

NATIONAL HIGHWAY SAFETY BUREAU
SECRETARY OF TRANSPORTATION
FHWA
NATIONAL MOTOR VEHICLE SAFETY ADVISORY COUNCIL
OFFICE OF THE DIRECTOR NHSB
NATIONAL HIGHWAY SAFETY ADVISORY COMMITTEE
MOTOR VEHICLE SAFETY PERFORMANCE SERVICE
NATIONAL TRAFFIC SAFETY INSTITUTE
HIGHWAY SAFETY PROGRAMS SERVICE

Fig. 9. National advisory groups.

The laws under which the Bureau was established provide for two major national advisory groups. The National Motor Vehicle Safety Advisory Council relates to the standard setting process of the Motor Vehicle Safety Performance Service. The National Highway Safety Advisory Committee reviews the safety performance standards for state highway programs and makes recommendations on the content of these various programs.

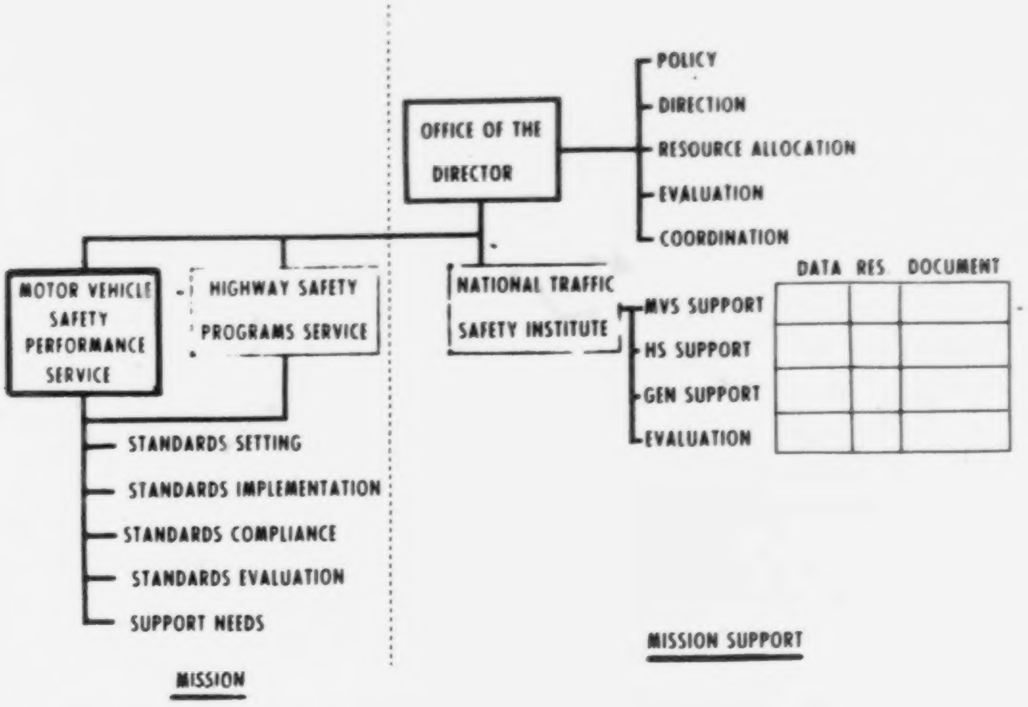

OFFICE OF THE DIRECTOR
POLICY
DIRECTION
RESOURCE ALLOCATION
EVALUATION
COORDINATION
MOTOR VEHICLE SAFETY PERFORMANCE SERVICE
HIGHWAY SAFETY PROGRAMS SERVICE
NATIONAL TRAFFIC SAFETY INSTITUTE
DATA
RES
DOCUMENT
MVS SUPPORT
HS SUPPORT
GEN SUPPORT
EVALUATION
STANDARDS SETTING
STANDARDS IMPLEMENTATION
STANDARDS COMPLIANCE
STANDARDS EVALUATION
SUPPORT NEEDS
MISSION
MISSION SUPPORT

Fig. 10. Functional organization.

The functional organization divides into the categories of mission and mission support.

The direct mission functions are performed by the two-line services, namely, the Motor Vehicle Safety Performance Service and the Highway Safety Programs Service. In both cases the work follows the same general pattern.

- The setting of standards
- Facilitating their implementation
- Evaluating compliance
- Evaluating effectiveness
- Identifying back-up support needs

The mission support functions cover the activities of the National Highway Safety Institute and the Office of the Director.

The Institute, which with the two-line services comprises the Bureau's three major units, implements the research, test, development, demonstration, and manpower training needs of the two standard-setting groups. Although some context of its activities will come from within, the bulk of the Institute's program requirements will come, at least in the initial years, from the two-line services. Stated otherwise, most of the Institute's activities are to be structured around direct needs of the two-line services.

It is important to observe that we have brought all the Bureau's research, test, development, and manpower training activities plus all outside contracting into this one organizational unit. Several reasons support this approach. One compelling one is that in the safety field many contract activities produce results that are common to state highway safety programs as well as to motor vehicle safety standards. For example, field investigations of real accidents, controlled barrier impacts on test tracks, detailed analyses of motor vehicle inspection, and other aspects of used car safety all directly relate to both services. We accordingly adopted a policy at the start of a unified contracting and research organization rather than two separate groups related to each service.

We further adopted a somewhat novel variation of operating the Institute. Without going into detailed description here, the central idea is to assign problem responsibility to a task force leader and give him the prerogative of deciding how to divide the work between outside contractors, or to transfer tasks to other government agencies, or to conduct work in-house when the Bureau has its own facilities. We are not going to have separate units that deal only with outside contracts and others that comprise in-house capability. Total problem responsibility is centered on the Task Force Leader.

1.0 IMPROVE SAFETY PERFORMANCE STANDARDS OF MOTOR VEHICLES AND MOTOR VEHICLE EQUIPMENT

2.0 ASSURE PROPER SAFETY QUALITY OF VEHICLES IN USE

3.0 ASSIST STATES AND LOCAL GOVERNMENTS IN EXPANDING AND IMPROVING THEIR HIGHWAY SAFETY PROGRAMS

4.0 IMPROVE THE PROCESS OF HIGHWAY ACCIDENT INVESTIGATION, VEHICLE DAMAGE AND INJURY ASSESSMENT, AND INFORMATION ANALYSI

5.0 PROVIDE PROGRAM SUPPORT AND FACILITIES

Fig. 11. NHSB overall program planning structure.

The overall program planning structure of the National Highway Safety Bureau involves five major areas of responsibility. The Bureau's program objectives within these areas are to:

1. Improve safety performance standards of motor vehicles and motor vehicle equipment,
2. Assure proper safety quality of vehicles in use,
3. Assist states and local governments in expanding and improving their highway safety programs,
4. Improve the process of highway accident investigation, vehicle damage and injury assessment, and information analysis, and
5. Provide program support and facilities.

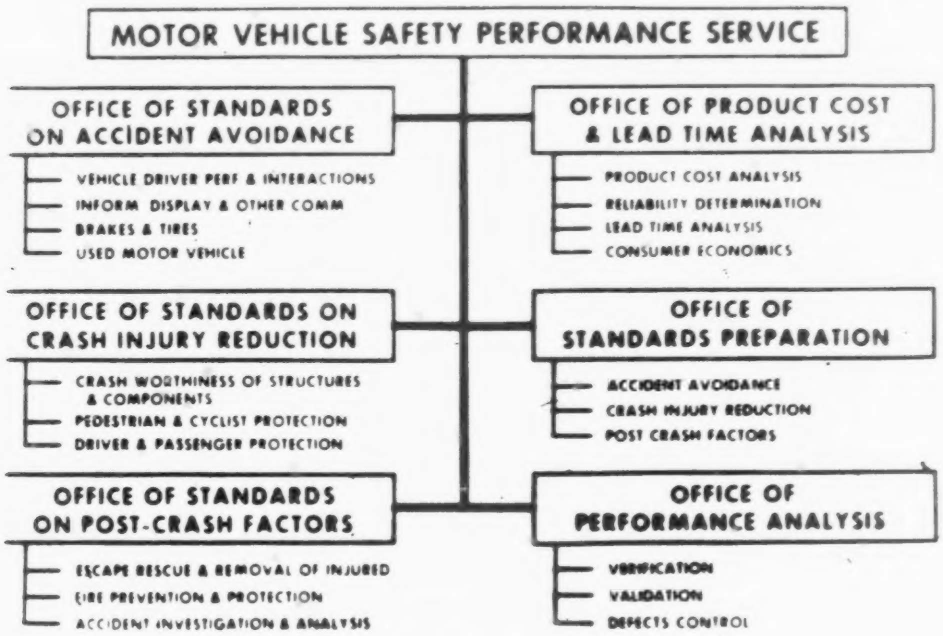

MOTOR VEHICLE SAFETY PERFORMANCE SERVICE
OFFICE OF STANDARDS ON ACCIDENT AVOIDANCE
VEHICLE DRIVER PERF & INTERACTIONS
INFORM DISPLAY & OTHER COMM
BRAKES & TIRES
USED MOTOR VEHICLE
OFFICE OF PRODUCT COST & LEAD TIME ANALYSIS
PRODUCT COST ANALYSIS
RELIABILITY DETERMINATION
LEAD TIME ANALYSIS
CONSUMER ECONOMICS
OFFICE OF STANDARDS ON CRASH INJURY REDUCTION
CRASH WORTHINESS OF STRUCTURES & COMPONENTS
PEDESTRIAN & CYCLIST PROTECTION
DRIVER & PASSENGER PROTECTION
OFFICE OF STANDARDS PREPARATION
ACCIDENT AVOIDANCE
CRASH INJURY REDUCTION
POST CRASH FACTORS
OFFICE OF STANDARDS ON POST-CRASH FACTORS
ESCAPE RESCUE & REMOVAL OF INJURED
FIRE PREVENTION & PROTECTION
ACCIDENT INVESTIGATION & ANALYSIS
OFFICE OF PERFORMANCE ANALYSIS
VERIFICATION
VALIDATION
DEFECTS CONTROL

Fig. 12. Organization and functions of the Motor Vehicle Safety Performance Service.

These are the organizational elements and functions of the Motor Vehicle Safety Performance Service.

The Office of Standards on Accident Avoidance is concerned with vehicle-driver performance and interactions, information displays and other communications functions, brakes and tires, and used motor vehicles.

The Office of Standards on Crash Injury Reduction is is concerned with crashworthiness of structures and components, pedestrian and cyclist protection, and driver and passenger protection.

The Office of Standards on Post-Crash Factors addresses itself to escape rescue and removal of injured, fire prevention and protection, and accident investigation and analysis.

The Office of Product Cost and Lead Time Analysis is concerned with product cost analysis, reliability determination, lead time analysis, and consumer economics.

The Office of Standards Preparation functions in the areas of accident avoidance, crash injury reduction, and post-crash factors.

The Office of Performance Analysis is concerned with verification of technical and performance data, validation of standards effectiveness, and the general area of defects control.

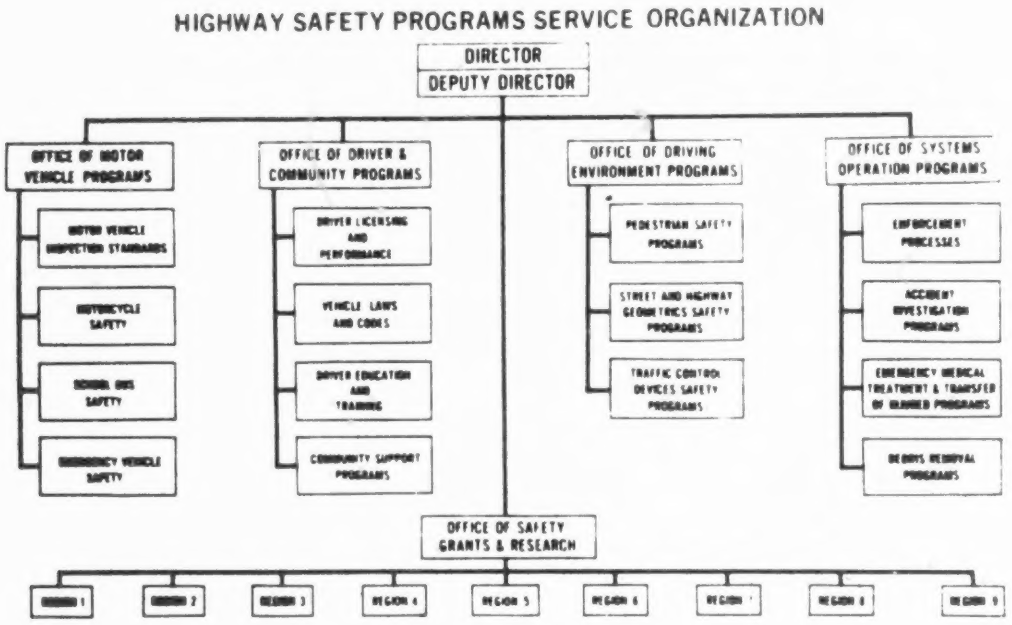

HIGHWAY SAFETY PROGRAMS SERVICE ORGANIZATION
DIRECTOR
DEPUTY DIRECTOR
OFFICE OF MOTOR VEHICLE PROGRAMS
MOTOR VEHICLE INSPECTION STANDARDS
MOTORCYCLE SAFETY
SCHOOL BUS SAFETY
EMERGENCY VEHICLE SAFETY
OFFICE OF DRIVER & COMMUNITY PROGRAMS
DRIVER LICENSING AND PERFORMANCE
VEHICLE LAWS AND CODES
DRIVER EDUCATION AND TRAINING
COMMUNITY SUPPORT PROGRAMS
OFFICE OF DRIVING ENVIRONMENT PROGRAMS
PEDESTRIAN SAFETY PROGRAMS
STREET AND HIGHWAY GEOMETRICS SAFETY PROGRAMS
TRAFFIC CONTROL DEVICES SAFETY PROGRAMS
OFFICE OF SYSTEMS OPERATION PROGRAMS
ENFORCEMENT PROCESSES
ACCIDENT INVESTIGATION PROGRAMS
EMERGENCY MEDICAL TREATMENT & TRANSFER OF INJURED PROGRAMS
DEBRIS REMOVAL PROGRAMS
OFFICE OF SAFETY GRANTS & RESEARCH
REGION 1
REGION 2
REGION 3
REGION 4
REGION 5
REGION 6
REGION 7
REGION 8
REGION 9

Fig. 13. Organization and functions of the Highway Safety Programs Service.

Figure 13 contains the major organizational elements and functions of the Highway Safety Programs Service.

The Office of Motor Vehicle Programs is concerned with motor vehicle inspection standards, motorcycle safety, school bus safety, and emergency vehicle safety.

The Office of Driver and Community Programs is concerned with driver licensing and performance, vehicle laws and codes, driver education and training, and community support programs.

The Office of Driving Environment Programs functions in the areas of pedestrian, street, and highway geometrics and traffic control devices safety programs.

The Office of Systems Operation Programs is concerned with enforcement procedures, accident investigation programs, emergency medical treatment and transfer of the injured, and debris removal (or, as it is now called, debris hazard control and cleanup) programs.

The Office of Safety Grants and Research serves as the 402 grant processing unit for the states and performs a liaison function with the nine Regional Directors of the Bureau.

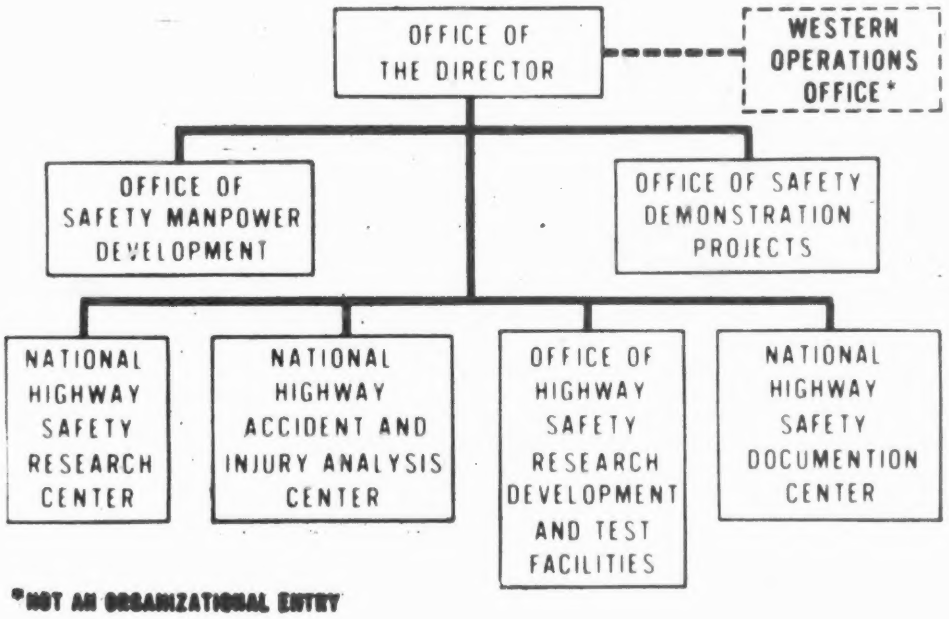

OFFICE OF THE DIRECTOR
WESTERN OPERATIONS OFFICE*
OFFICE OF SAFETY MANPOWER DEVELOPMENT
OFFICE OF SAFETY DEMONSTRATION PROJECTS
NATIONAL HIGHWAY SAFETY RESEARCH CENTER
NATIONAL HIGHWAY ACCIDENT AND INJURY ANALYSIS CENTER
OFFICE OF HIGHWAY SAFETY RESEARCH DEVELOPMENT AND TEST FACILITIES
NATIONAL HIGHWAY SAFETY DOCUMENTION CENTER
*NOT AN ORGANIZATIONAL ENTRY

Fig. 14. National Highway Safety Institute organization chart.

The National Highway Safety Institute brings the research, test, facilities, accident and injury analysis, demonstration, documentation, and manpower development activities conducted by the National Highway Safety Bureau into one organizational unit. Its organizational elements consist of three primary working units, called "centers," and three offices, including the Office of the Director. The Institute also maintains a Western Operations Office which perhaps should appear as a subordinate unit to the Research Center since the personnel assigned to that office essentially function as research contract managers. The Director's Office is responsible for directing research, development, test, evaluation, documentation, facilities, data processing, and manpower programs.

The Office of Safety Demonstration Projects supports, implements, and evaluates demonstrations to facilitate the development, validation, and introduction into practice by state and community agencies or private persons of new and improved techniques related to highway safety.

The Office of Safety Manpower Development, which I direct, plans and administers activities designed to increase the supply and improve the skill of all classes of manpower required to implement effective traffic safety programs at the Federal, state, and local levels through the Nation. Within the Office of Safety Manpower are the Divisions of Technical Manpower, Professional Manpower, and Research Manpower.

The National Highway Safety Accident and Injury Analysis Center is responsible for compiling all data related to the highway and traffic safety programs, conducting mathematical analyses of all data, operating the computer system, and establishing and operating the information and transmission links of the Bureau. It is concerned with compiling information developed from the accident investigation process. This Center develops and keeps current the statistical data base of the Bureau with regard to drivers, vehicles, highways, and accidents and other variables required to identify and evaluate national traffic safety trends. It provides for compatibility between its own operations and those of the state and local centers. It also maintains the National Driver Register. Within the Accident and Injury Analysis Center are the Offices of Systems Design, Systems Implementation, Data Operations, Statistical Analysis, and the National Driver Register.

The National Highway Safety Documentation Center acquires and maintains a comprehensive collection of publications, research reports, training manuals, and other documents related to any phase of traffic and highway safety. It develops documents and audio-visual aids for the dissemination of safety information to interested groups and individuals. The Documentation Center also adopts scientific and technical materials for use by various popular media such as newspapers, magazines, and television. Examples of explicit information dissemination functions performed by the Documentation Center include the establishment of library services for the Highway Safety Bureau and for the public, technical information services, training aids services, educational public information programs, and a management information system. Thus the Documentation Center functions in a relatively wide range of subject areas and services all segments of the public as well as providing technical information support for the Bureau staff.

The National Highway Safety Research Center performs or sponsors, through contracts or grants or interagency funds, the research development, testing, and evaluation projects required to support the primary mission of the Bureau. The Research Center also operates traffic safety laboratories. In general, the Research Center performs or sponsors research required to develop new knowledge related to various areas within the traffic safety field. Among its specific tasks, the Research Center is concerned with performing or sponsoring research required to:

1. Develop or upgrade uniform standards for state highway safety programs,

2. Develop or upgrade Federal motor vehicle safety standards,

3. Develop a uniform quality grading system for motor vehicle tires, and

4. Assist other components of the Bureau in administering or enforcing the Highway and Traffic Safety Acts.

The Office of Highway Safety Research, Development and Test Facilities coordinates the use of existing highway safety research, development, and test facilities and plans for the establishment of highway safety research laboratories and test facilities needed in the future.

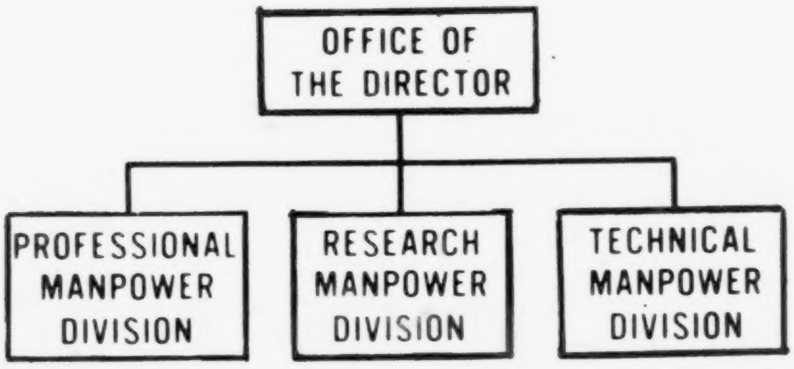

OFFICE OF THE DIRECTOR
PROFESSIONAL MANPOWER DIVISION
RESEARCH MANPOWER DIVISION
TECHNICAL MANPOWER DIVISION

Fig. 15. Organization chart: Office of Safety Manpower Development.

Within the Institute, the Office of Safety Manpower Development contains the Divisions of Research Manpower, Professional Manpower, and Technical Manpower.

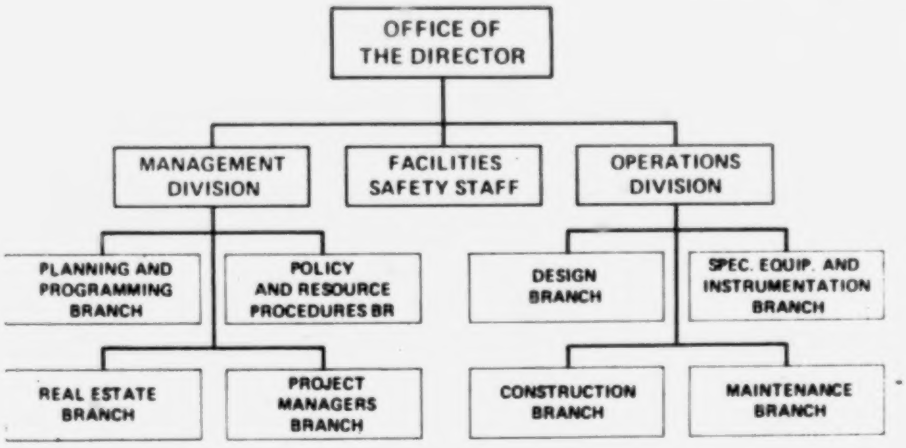

OFFICE OF THE DIRECTOR
MANAGEMENT DIVISION
FACILITIES SAFETY STAFF
OPERATIONS DIVISION
PLANNING AND PROGRAMMING BRANCH
POLICY AND RESOURCE PROCEDURES BR
DESIGN BRANCH
SPEC. EQUIP. AND INSTRUMENTATION BRANCH
REAL ESTATE BRANCH
PROJECT MANAGERS BRANCH
CONSTRUCTION BRANCH
MAINTENANCE BRANCH

Fig. 16. Organization chart: Office of Research, Development, and Test Facilities.

The Office of Research, Development, and Test Facilities contains a Management Division concerned with planning and programming policy and resource procedures, real estate, and project management; an Operations Division concerned with design, special equipment and instrumentation, construction, and maintenance; and a Facilities Safety Staff which will function in the future in support of facilities operations.

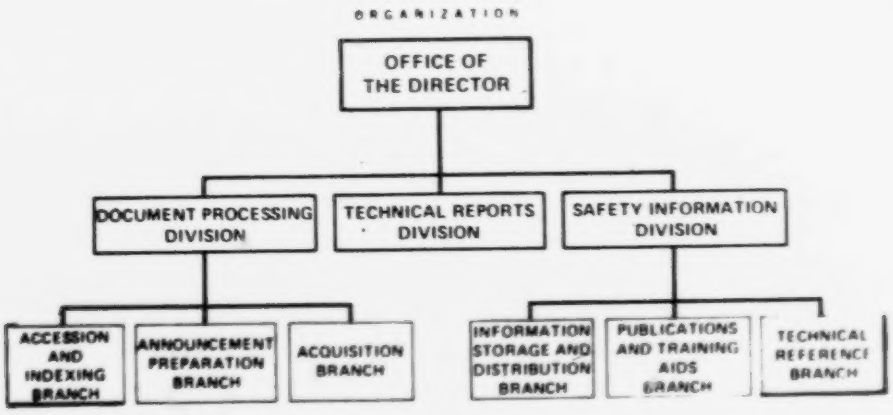

ORGANIZATION
OFFICE OF THE DIRECTOR
DOCUMENT PROCESSING DIVISION
TECHNICAL REPORTS DIVISION
SAFETY INFORMATION DIVISION
ACCESSION AND INDEXING BRANCH
ANNOUNCEMENT PREPARATION BRANCH
ACQUISITION BRANCH
INFORMATION STORAGE AND DISTRIBUTION BRANCH
PUBLICATIONS AND TRAINING AIDS BRANCH
TECHNICAL REFERENCE BRANCH

Fig. 17. Organization chart: National Highway Safety Documentation Center.

The Documentation Center contains the Divisions of Document Processing, Technical Reports, and Safety Information. The Document Processing Division is concerned with accession and indexing, announcement preparation, and document acquisition. The Information Division performs the functions of information storage and distribution, publications and training aid preparation, and technical reference.

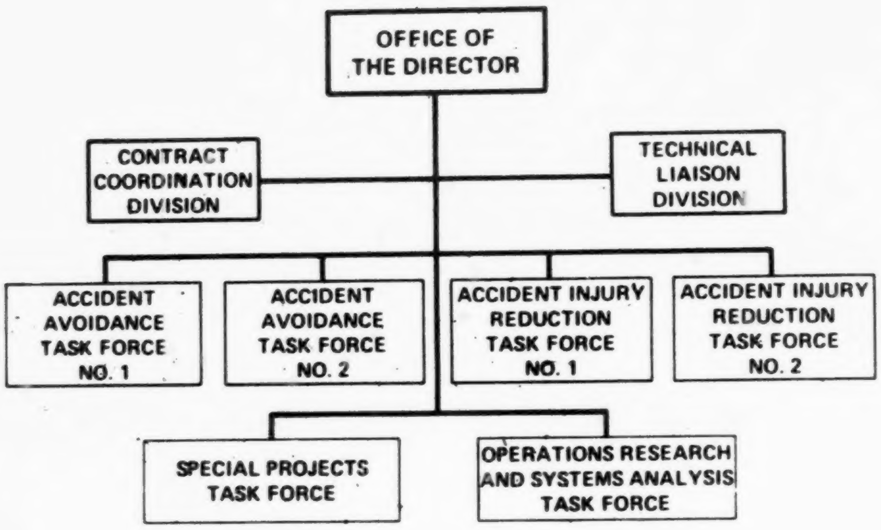

OFFICE OF THE DIRECTOR
CONTRACT COORDINATION DIVISION
TECHNICAL LIAISON DIVISION
ACCIDENT AVOIDANCE TASK FORCE NO. 1
ACCIDENT AVOIDANCE TASK FORCE NO. 2
ACCIDENT INJURY REDUCTION TASK FORCE NO. 1
ACCIDENT INJURY REDUCTION TASK FORCE NO. 2
SPECIAL PROJECTS TASK FORCE
OPERATIONS RESEARCH AND SYSTEMS ANALYSIS TASK FORCE

Fig. 18. Organization chart: National Highway Safety Research Center.

The Research Center contains two major divisions, contract coordination and technical liaison. In addition, the Research Center operates task forces, two concerned with crash avoidance and crash injury reduction; one concerned with operations research and systems analysis; and one concerned with special projects.

An extensive contract research, test, and development program was initiated during fiscal year 1967 and continued during fiscal years 1968 and 1969. This program was funded in excess of 8 million dollars in FY 1967, 14.7 million dollars in FY 1968, and 16 million dollars in FY 1969. The overall approach of the initial research and development support studies centered on an immediate, hard-hitting attack to provide the urgently needed answers as soon as possible. This is being followed by work on the gaps of knowledge so that we can begin to broaden our base of understanding of accident and injury causes.

- **EVALUATE MOTOR VEHICLE SAFETY PERFORMANCE**
- **EVALUATE EXISTING RESEARCH AND DEVELOPMENT STUDIES**
- **DEFINE MANAGEMENT SUPPORT TASKS**
- **DEFINE SAFETY PROGRAM SUPPORT TASKS**

Fig. 19. Purposes of the initial studies.

The initial highway and traffic safety studies attacked the problem on several major fronts to achieve four major purposes:

1. To evaluate actual safety performance of the motor vehicle itself, including trucks, buses, and motorcycles, with attention directed to such questions as used car safety, automotive fabrication and compliance with motor vehicle safety standards, occupant protection, seat design, behavior of vehicles (and their human cargo) in crash situations, and vehicle handling properties.

2. To evaluate the existing research and development studies required to give intensive scientific and engineering support to the National Highway Safety Program. This includes the development of traffic safety testing, research, and development facilities and equipment; accident and injury analysis and documentation centers; traffic accidents and human impact tolerance investigations, alcohol safety, and

the use of system engineered cost effectiveness countermeasures.

3. To define the management support tasks required to assist each state in establishing and operating the traffic safety program recommended by the National Highway Safety Bureau, emphasizing necessary programs to develop, educate, and train traffic safety personnel across the nation for engineering program management, and motor vehicle safety testing, research and development; to prepare and publish uniform standards and guidelines for use by each state to implement its own safety programs; and to improve emergency medical care techniques, including the adaptation of the paramilitary medical care and evacuation procedures that have proved successful on the battlefield.

4. To define the safety program support tasks required to help each state to legislate, establish, and implement uniform traffic safety regulations within their communities, such as driver education and licensing, traffic safety enforcement, uniform motor vehicle inspection procedures, accident investigation improvements, and the encouragement and support of community traffic safety programs.

STATUS PROGRAM MANAGEMENT GUIDELINES

PROJECTS MANAGED BY THE OFFICE
OF SAFETY MANPOWER DEVELOPMENT
DURING FISCAL YEAR 1968

SAFETY MANAGEMENT MANPOWER
- THE AUTOMOTIVE SAFETY FOUNDATION

SAFETY SPECIALIST MANPOWER
- BOOZ, ALLEN AND HAMILTON, INC.

SAFETY RESEARCH MANPOWER
- THE UNIVERSITY OF NORTH CAROLINA

STATE PROGRAM MANAGEMENT GUIDELINES
- PEAT, MARWICK, LIVINGSTON AND COMPANY

Fig. 20. Summary of contracts managed by the Office of Safety Manpower Development during FY 1968.

I shall now briefly review some of the research contracts administered by the Office of Safety Manpower Development which may be of particular interest to you.

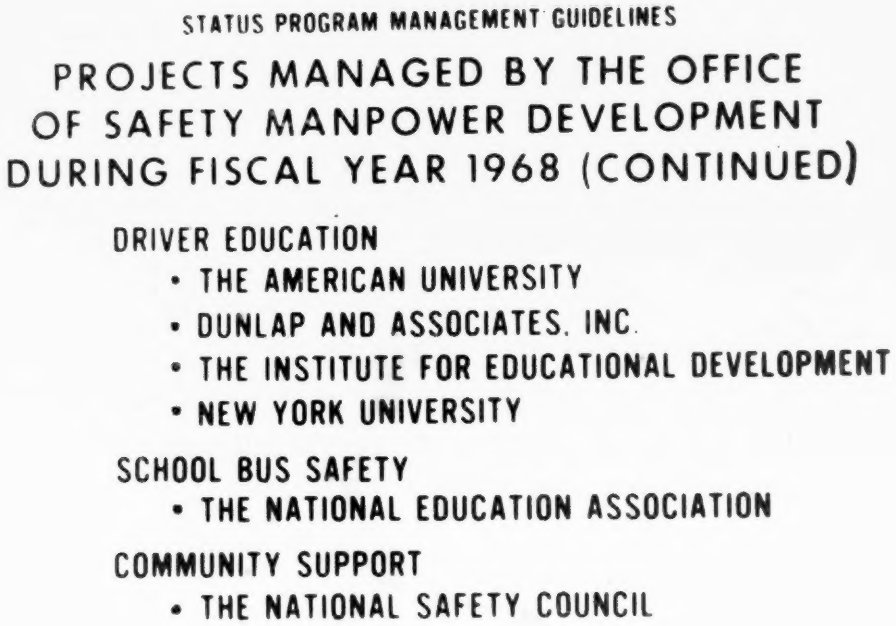
During Fiscal Year 1968, ten contracts totaling $1,104,000 were managed by the staff of our office. Some of these projects are listed on this slide.

1. The Safety Management Manpower project conducted by the Automotive Safety Foundation involved the development and presentation of a three-day course for training highway safety program managers and state Governor's Representatives. The contractor also developed and tested an information communications system between the National Highway Safety Bureau and the states.

2. The Safety Specialist Manpower project conducted by Booz, Allen and Hamilton, Inc., is a study of the current and projected safety manpower requirements within each of the states. The purposes of this study are to define the safety specialist manpower categories, identify the number of safety specialists presently needed and those required in the future, identify actual and potential manpower resources, identify education and training institutions and organizations capable of transforming unskilled manpower into safety specialists, and prepare plans and programs to facilitate the actual manning of the several state and local highway safety programs. In another paper, the director of this project will present some of the findings of this study.

3. Certain phases of the Safety Research Manpower problem were studied by the University of North Carolina. The Highway Safety Research Center at UNC developed and tested a pilot course and recommended a multidisciplined graduate-level program for the training of safety research scientists and engineers who will man the major research efforts urgently needed throughout the nation.

4. Peat, Marwick, Livingston and Company has prepared a draft report containing recommended State Program Management Guidelines. This contractor developed guidelines describing managerial policies, techniques, documentation, methods, and procedures for conducting the state safety programs specified in the State Highway Safety Program Standards.



STATUS PROGRAM MANAGEMENT GUIDELINES

PROJECTS MANAGED BY THE OFFICE
OF SAFETY MANPOWER DEVELOPMENT
DURING FISCAL YEAR 1968 (CONTINUED)

DRIVER EDUCATION
- THE AMERICAN UNIVERSITY
- DUNLAP AND ASSOCIATES, INC.
- THE INSTITUTE FOR EDUCATIONAL DEVELOPMENT
- NEW YORK UNIVERSITY

SCHOOL BUS SAFETY
- THE NATIONAL EDUCATION ASSOCIATION

COMMUNITY SUPPORT
- THE NATIONAL SAFETY COUNCIL

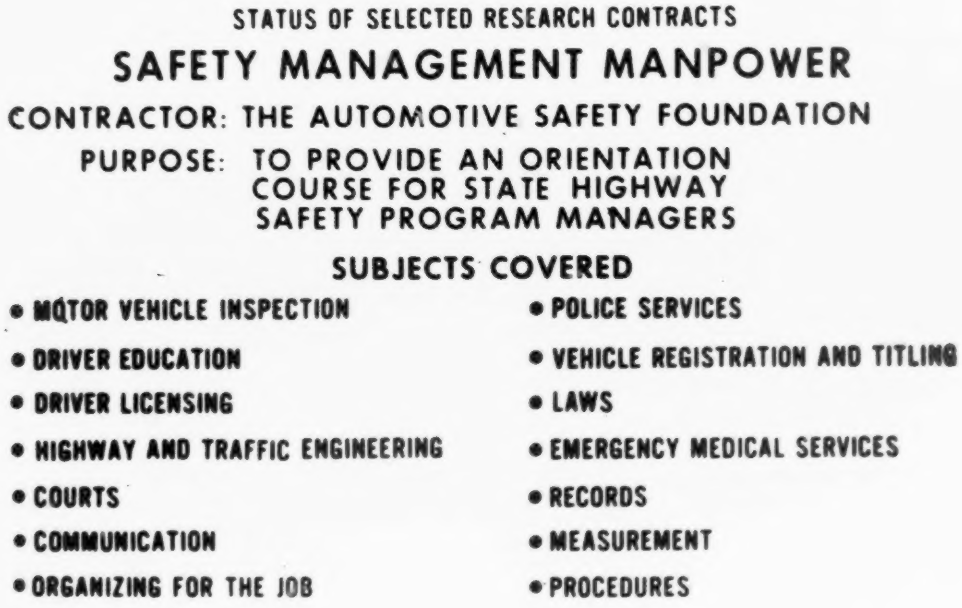
Fig. 20a. Summary of contracts managed by the Office of Safety Manpower Development during FY 1968 (continued).

5. The Driver Education project involved four contractors: The American University; Dunlap and Associates, Incorporated; The Institute for Educational Development; and New York University. These four contractors were assigned the same work statement; namely, to develop methods and plans for evaluating the effectiveness of all types of driver education and training programs at state and local levels, including teacher preparation programs.

6. The School Bus Safety study was conducted by the National Commission on Safety Education of the National Education Association. The purpose of this study was to organize and present evidence and knowledge on the subject of school transportation safety within the various states and communities throughout the nation.

7. The Community Support study conducted by the National Safety Council provided a "state of the art" description of highway safety community support programs. The NSC collected, documented, and organized presently available information on state and local community safety programs.

I shall briefly describe the status of each of these projects, the follow-on contract work we are now undertaking, and the new research projects we are managing in our Office during Fiscal Year 1969.



STATUS OF SELECTED RESEARCH CONTRACTS

SAFETY MANAGEMENT MANPOWER

CONTRACTOR: THE AUTOMOTIVE SAFETY FOUNDATION

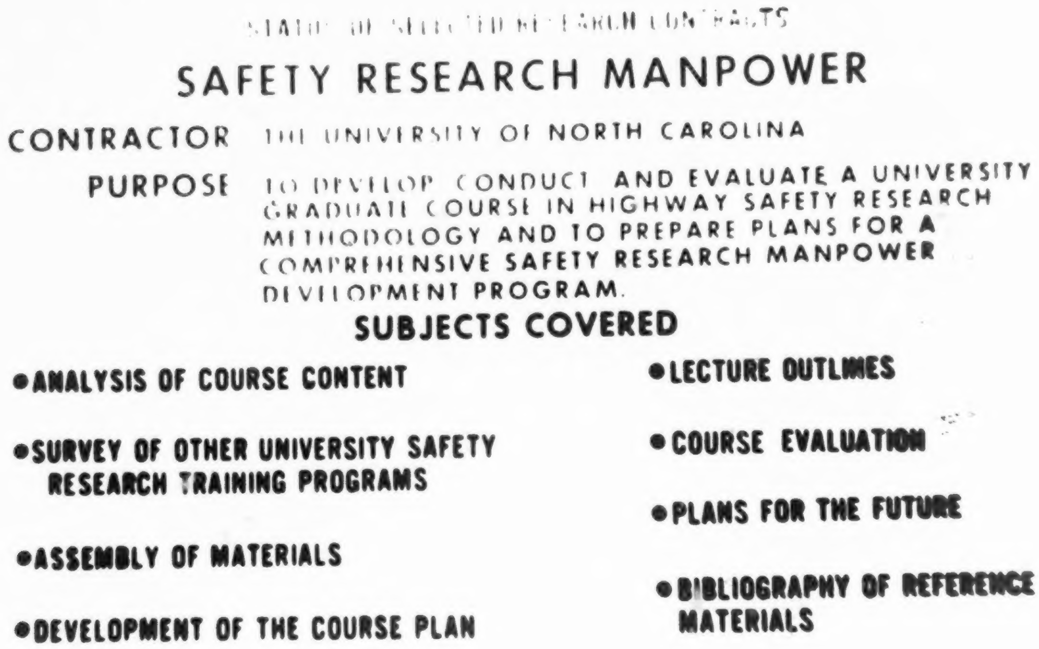
PURPOSE: TO PROVIDE AN ORIENTATION COURSE FOR STATE HIGHWAY SAFETY PROGRAM MANAGERS

SUBJECTS COVERED

- MOTOR VEHICLE INSPECTION
- DRIVER EDUCATION
- DRIVER LICENSING
- HIGHWAY AND TRAFFIC ENGINEERING
- COURTS
- COMMUNICATION
- ORGANIZING FOR THE JOB
- POLICE SERVICES
- VEHICLE REGISTRATION AND TITLING
- LAWS
- EMERGENCY MEDICAL SERVICES
- RECORDS
- MEASUREMENT
- PROCEDURES

Fig. 21. Safety Management Manpower.

The Safety Management Manpower project consisted of a series of three-day orientation courses in safety program management conducted by the Automotive Safety Foundation. A total of 438 highway safety management personnel from national, regional, and state levels were in attendance at the six regional presentations. Courses were conducted during May and June of 1968 at Atlanta, Georgia; Berkeley, California; Covington, Kentucky; Omaha, Nebraska; Wakefield, Massachusetts; and Denver, Colorado. In addition to state personnel, the nine Regional Directors of NHSB attended the first course in Atlanta. Subjects covered included motor vehicle inspection, driver education, driver licensing, highway and traffic engineering, courts, communication, organizing for the job, police services, vehicle registration and titling, laws, emergency medical services, records, measurement, and procedures. In addition to lectures and general discussion periods, the courses included workshops organized around the major subjects presented.



STATUS OF SELECTED RESEARCH CONTRACTS

SAFETY RESEARCH MANPOWER

CONTRACTOR THE UNIVERSITY OF NORTH CAROLINA

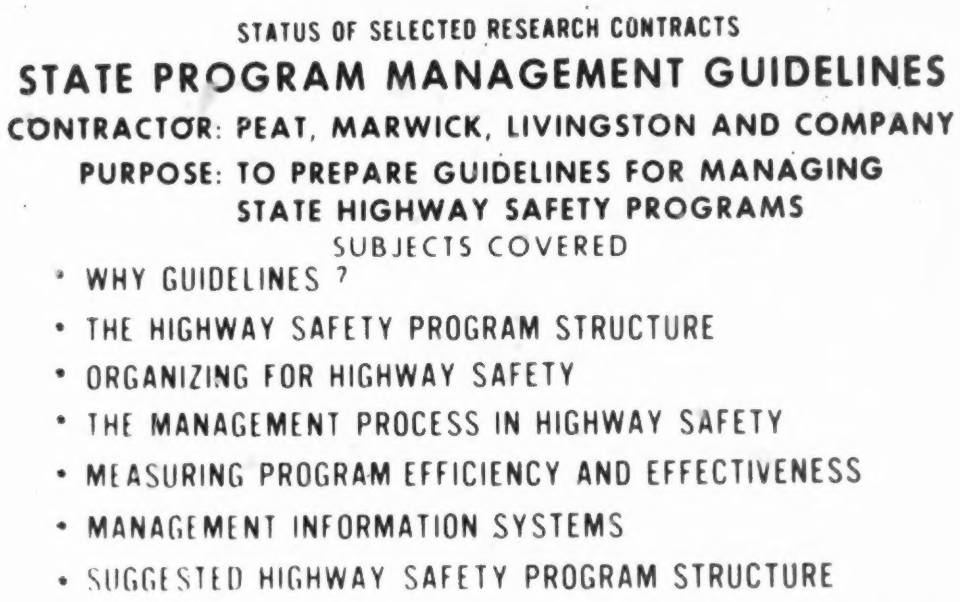
PURPOSE TO DEVELOP CONDUCT AND EVALUATE A UNIVERSITY GRADUATE COURSE IN HIGHWAY SAFETY RESEARCH METHODOLOGY AND TO PREPARE PLANS FOR A COMPREHENSIVE SAFETY RESEARCH MANPOWER DEVELOPMENT PROGRAM.

SUBJECTS COVERED

- ANALYSIS OF COURSE CONTENT
- SURVEY OF OTHER UNIVERSITY SAFETY RESEARCH TRAINING PROGRAMS
- ASSEMBLY OF MATERIALS
- DEVELOPMENT OF THE COURSE PLAN
- LECTURE OUTLINES
- COURSE EVALUATION
- PLANS FOR THE FUTURE
- BIBLIOGRAPHY OF REFERENCE MATERIALS

Fig. 22. Safety Research Manpower.

The University of North Carolina developed, conducted, and evaluated a university graduate-level course in highway safety research methodology. Twelve graduate students completed the course for credit at the University. Seven faculty members audited each of the fourteen two-hour sessions. Plans were presented for expanding this course to a comprehensive multidisciplined graduate-level safety research manpower development program. Major sections of the final report are identified in Figure 22.



STATUS OF SELECTED RESEARCH CONTRACTS

STATE PROGRAM MANAGEMENT GUIDELINES

CONTRACTOR: PEAT, MARWICK, LIVINGSTON AND COMPANY

PURPOSE: TO PREPARE GUIDELINES FOR MANAGING STATE HIGHWAY SAFETY PROGRAMS

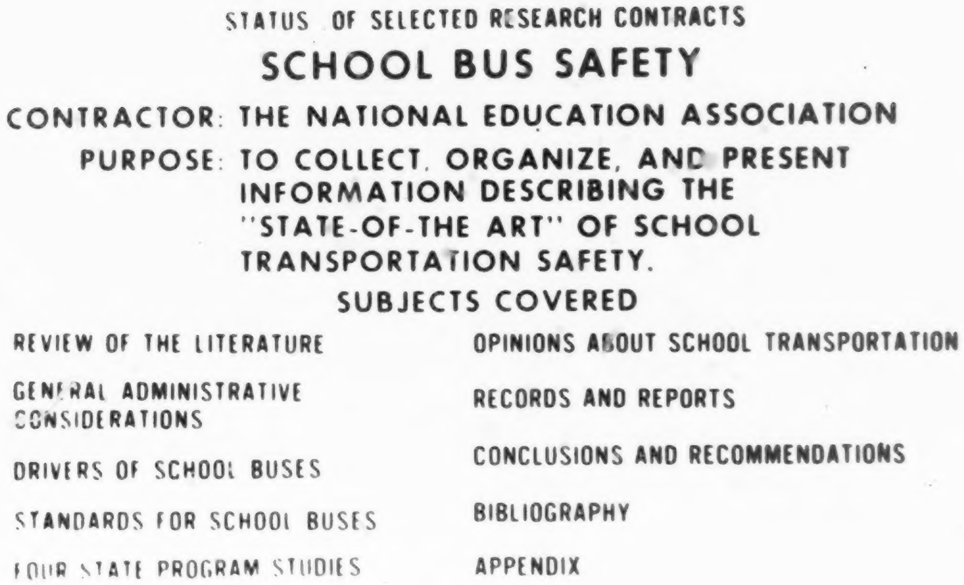
SUBJECTS COVERED

- WHY GUIDELINES ?
- THE HIGHWAY SAFETY PROGRAM STRUCTURE
- ORGANIZING FOR HIGHWAY SAFETY
- THE MANAGEMENT PROCESS IN HIGHWAY SAFETY
- MEASURING PROGRAM EFFICIENCY AND EFFECTIVENESS
- MANAGEMENT INFORMATION SYSTEMS
- SUGGESTED HIGHWAY SAFETY PROGRAM STRUCTURE

Fig. 23. State Program Management Guidelines.

The final report prepared by Peat, Marwick, Livingston and Company entitled "Highway Safety Management Guidelines for State Governments" has been received. The next step is for the states to receive this information, accompanied by an opportunity to participate in a two-day training course on the application of the guidelines to state government operations. Suggestions for modifications in the guidelines will be received and reviewed by the National Highway Safety Bureau. The complete revised guidelines will then be published for use by the Bureau and by the states.

Some of the topics covered in this report are shown in Figure 23.



STATUS OF SELECTED RESEARCH CONTRACTS

SCHOOL BUS SAFETY

CONTRACTOR: THE NATIONAL EDUCATION ASSOCIATION

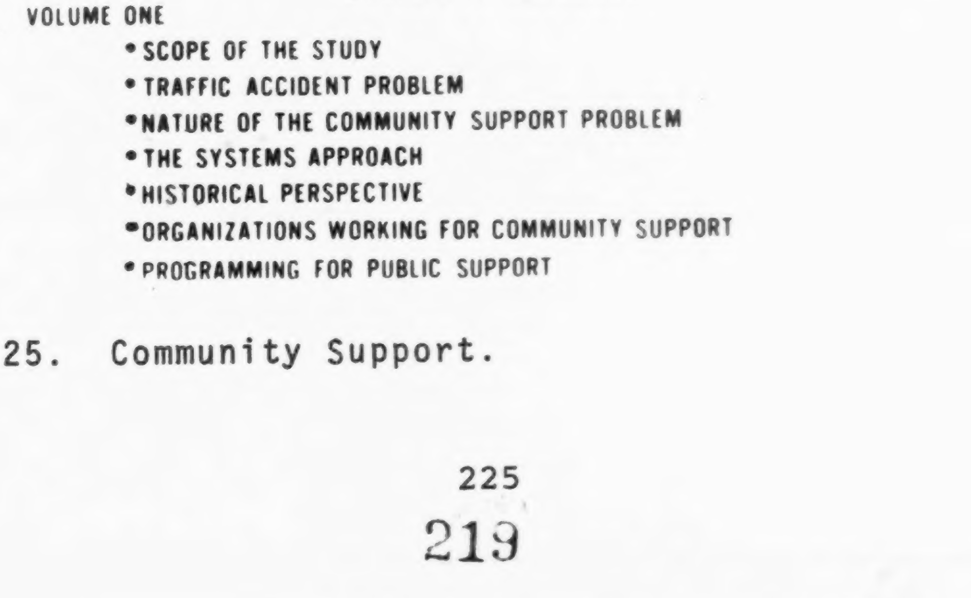
PURPOSE: TO COLLECT, ORGANIZE, AND PRESENT INFORMATION DESCRIBING THE "STATE-OF-THE ART" OF SCHOOL TRANSPORTATION SAFETY.

SUBJECTS COVERED

- REVIEW OF THE LITERATURE
- GENERAL ADMINISTRATIVE CONSIDERATIONS
- DRIVERS OF SCHOOL BUSES
- STANDARDS FOR SCHOOL BUSES
- FOUR STATE PROGRAM STUDIES
- OPINIONS ABOUT SCHOOL TRANSPORTATION
- RECORDS AND REPORTS
- CONCLUSIONS AND RECOMMENDATIONS
- BIBLIOGRAPHY
- APPENDIX

Fig. 24. School Bus Safety.

The National Commission on Safety Education of the National Education Association conducted a study of school bus safety in the United States. The purpose of this "state of the art" study was to collect, organize, and present evidence and knowledge on the subject of school transportation safety.



STATUS OF SELECTED RESEARCH CONTRACTS

COMMUNITY SUPPORT

CONTRACTOR: THE NATIONAL SAFETY COUNCIL

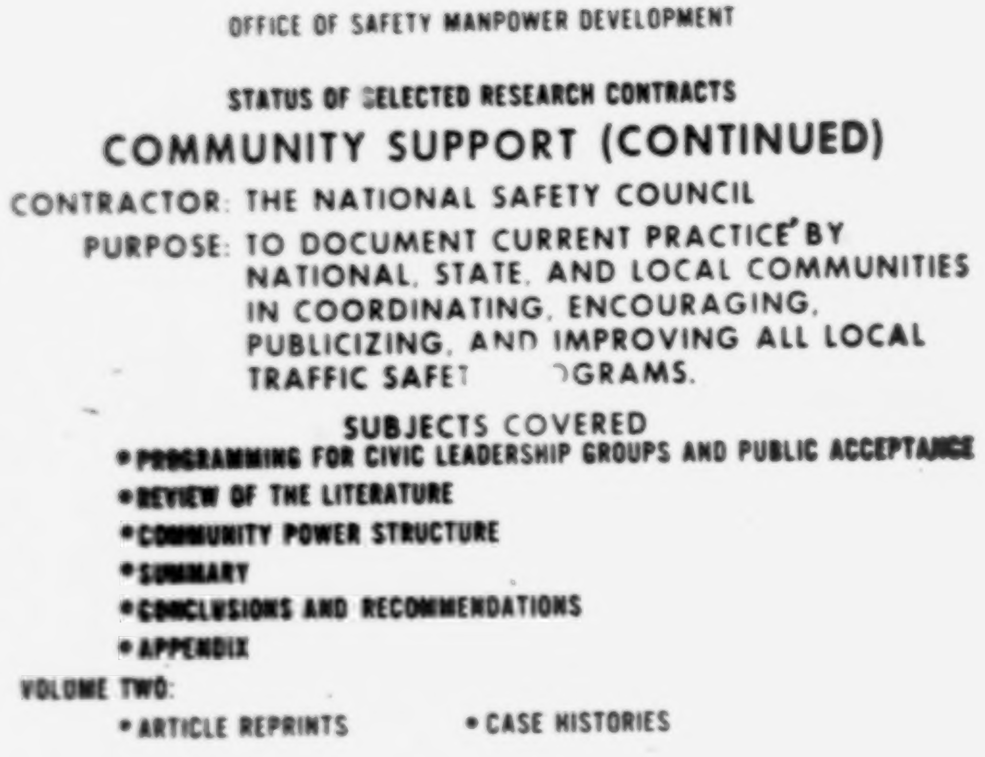
PURPOSE: TO DOCUMENT CURRENT PRACTICE BY NATIONAL, STATE, AND LOCAL COMMUNITIES IN COORDINATING, ENCOURAGING, PUBLICIZING, AND IMPROVING ALL LOCAL TRAFFIC SAFETY PROGRAMS.

SUBJECTS COVERED

VOLUME ONE

- SCOPE OF THE STUDY
- TRAFFIC ACCIDENT PROBLEM
- NATURE OF THE COMMUNITY SUPPORT PROBLEM
- THE SYSTEMS APPROACH
- HISTORICAL PERSPECTIVE
- ORGANIZATIONS WORKING FOR COMMUNITY SUPPORT
- PROGRAMMING FOR PUBLIC SUPPORT

Fig. 25. Community Support.



OFFICE OF SAFETY MANPOWER DEVELOPMENT

STATUS OF SELECTED RESEARCH CONTRACTS

COMMUNITY SUPPORT (CONTINUED)

CONTRACTOR: THE NATIONAL SAFETY COUNCIL

PURPOSE: TO DOCUMENT CURRENT PRACTICE BY NATIONAL, STATE, AND LOCAL COMMUNITIES IN COORDINATING, ENCOURAGING, PUBLICIZING, AND IMPROVING ALL LOCAL TRAFFIC SAFETY PROGRAMS.

SUBJECTS COVERED

- PROGRAMMING FOR CIVIC LEADERSHIP GROUPS AND PUBLIC ACCEPTANCE
- REVIEW OF THE LITERATURE
- COMMUNITY POWER STRUCTURE
- SUMMARY
- CONCLUSIONS AND RECOMMENDATIONS
- APPENDIX

VOLUME TWO:

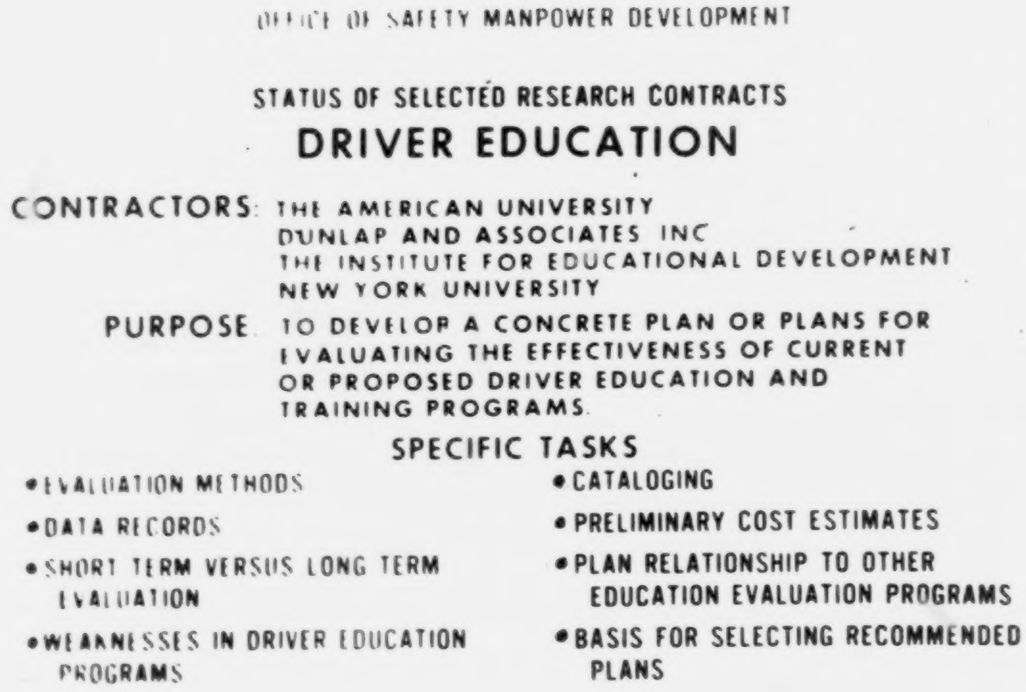
- ARTICLE REPRINTS
- CASE HISTORIES

Fig. 25a. Community Support (continued)

The National Safety Council conducted a study of the "state of the art" of community support programs in the highway safety field. The purpose of the study was to document current practices by national, state, and local communities in coordinating, encouraging, publicizing, and improving all local traffic safety programs. The final report was prepared in two volumes. Volume One contains the major elements and findings of the study, and Volume Two contains the case histories and back-up material.

Some of the subjects covered in the final report are included in Figure 25 and Figure 25a.

The appendix to Volume One contains an article on The Dynamics of Urban Program Development and Change and a 475-item bibliography. Volume Two contains reprints of various articles and reports and a section on case histories of successful community support action programs.



OFFICE OF SAFETY MANPOWER DEVELOPMENT

STATUS OF SELECTED RESEARCH CONTRACTS

DRIVER EDUCATION

CONTRACTORS: THE AMERICAN UNIVERSITY
DUNLAP AND ASSOCIATES INC
THE INSTITUTE FOR EDUCATIONAL DEVELOPMENT
NEW YORK UNIVERSITY

PURPOSE: TO DEVELOP A CONCRETE PLAN OR PLANS FOR EVALUATING THE EFFECTIVENESS OF CURRENT OR PROPOSED DRIVER EDUCATION AND TRAINING PROGRAMS.

SPECIFIC TASKS

- EVALUATION METHODS
- DATA RECORDS
- SHORT TERM VERSUS LONG TERM EVALUATION
- WEAKNESSES IN DRIVER EDUCATION PROGRAMS
- CATALOGING
- PRELIMINARY COST ESTIMATES
- PLAN RELATIONSHIP TO OTHER EDUCATION EVALUATION PROGRAMS
- BASIS FOR SELECTING RECOMMENDED PLANS

Fig. 26. Driver Education

The purpose of the driver education program evaluation project was to develop methods and plans for evaluating the effectiveness of all types of driver education and training programs at state and local levels, including teacher preparation programs. Final reports have been received from all four contractors working on this project: American University, Dunlap and Associates, Incorporated; The Institute for Educational Development, and New York University.

All four contractors received the same work statement; namely, to develop a concrete plan or plans for evaluating the effectiveness of current or proposed driver education and training programs. The specific tasks each performed are identified in Figure 26.

Task A - Evaluation Methods

The contractors documented in detail the method or methods recommended for the program evaluation plans.

Task B - Data Records

The contractors identified all necessary data together with the data source which shall be utilized.

Task C - Short-Term vs. Long-Term Evaluation

The contractors documented the application of the method or methods proposed in Task A with regard to short-term and long-term evaluation of the program. Advantages and disadvantages with relationship to stipulated short- and long-term evaluation were included.

Task D - Weaknesses in Driver Education Programs

The contractors documented the methods that shall be employed to determine weaknesses in the total driver education program. In addition to identifying the deficient areas, a method of assessing the affect or impact of the program was included.

Task E - Cataloging

The contractors were required to prepare clear and concise plans for fully cataloging and describing existing driver education systems.

Task F - Preliminary Cost Estimates

The contractors prepared preliminary cost estimates for data collection methods of program evaluation.

Task G - Plan Relationship to other Education Evaluation

With particular emphasis on public secondary schools, the contractors were required to research and document the relationship of the Task A plan or plans to other accepted evaluation techniques employed in United States educational institutions.

Task H - Basis for Selecting Recommended Plans

> The contractors were required to describe the alternate evaluation methods explored and the reason or justification for selecting the recommended method or methods.

The contractors addressed themselves to methods of evaluation in secondary schools, commercial driving schools, adult driver training schools, retraining and refresher programs, motorcycle operator training programs, teacher education and training programs, and special purpose driver education and training programs such as those conducted for fleet vehicle operators and emergency vehicle drivers. Each contractor also considered such related problems as defining the driving task, analysis of the man-vehicle-environment system, the "state of the art" in driver education research, and the criterion problem. Detailed information about each of these four projects will be presented by the principal investigators later during the symposium.

OFFICE OF SAFETY MANPOWER DEVELOPMENT

SAFETY SPECIALIST MANPOWER STUDY

REPORTS

SAFETY SPECIALIST MANPOWER REQUIREMENTS

SAFETY SPECIALIST MANPOWER RESOURCES

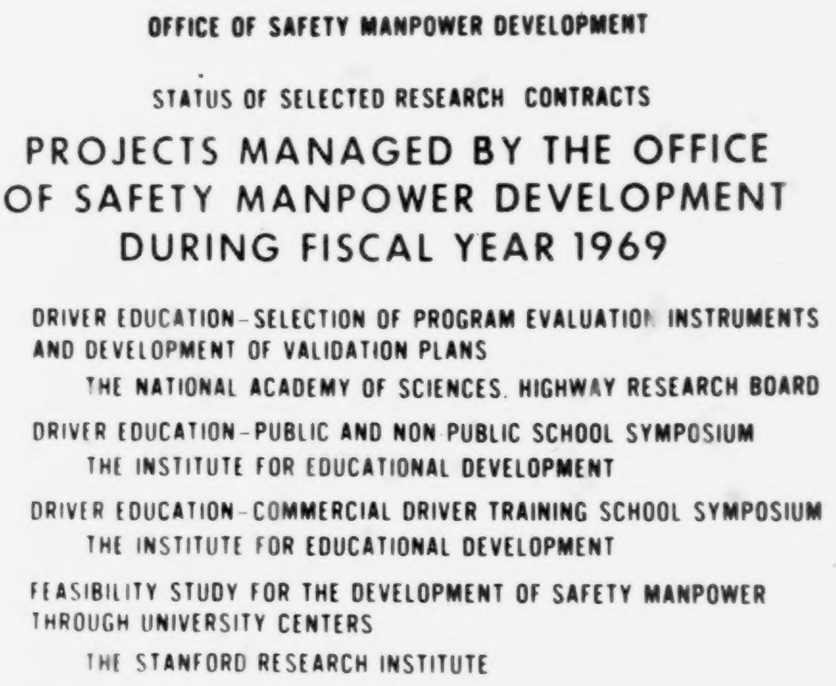
EDUCATIONAL FACILITIES

STATE ACTION PLANS

Fig. 27. Safety Specialist Manpower Study -- Purpose.

The purpose of the Safety Specialist Manpower Study conducted by Booz, Allen and Hamilton was to provide for current and projected manpower requirements for each of the states; identify actual and potential manpower resources; identify education and training institutions and organizations capable of transforming unskilled or insufficiently prepared manpower into safety specialists; and prepare programs to facilitate the actual manning of the several highway safety programs.

The results of this study will be presented in detail in another presentation.



OFFICE OF SAFETY MANPOWER DEVELOPMENT

STATUS OF SELECTED RESEARCH CONTRACTS

PROJECTS MANAGED BY THE OFFICE
OF SAFETY MANPOWER DEVELOPMENT
DURING FISCAL YEAR 1969

DRIVER EDUCATION-SELECTION OF PROGRAM EVALUATION INSTRUMENTS AND DEVELOPMENT OF VALIDATION PLANS
THE NATIONAL ACADEMY OF SCIENCES. HIGHWAY RESEARCH BOARD

DRIVER EDUCATION-PUBLIC AND NON PUBLIC SCHOOL SYMPOSIUM
THE INSTITUTE FOR EDUCATIONAL DEVELOPMENT

DRIVER EDUCATION-COMMERCIAL DRIVER TRAINING SCHOOL SYMPOSIUM
THE INSTITUTE FOR EDUCATIONAL DEVELOPMENT

FEASIBILITY STUDY FOR THE DEVELOPMENT OF SAFETY MANPOWER THROUGH UNIVERSITY CENTERS
THE STANFORD RESEARCH INSTITUTE

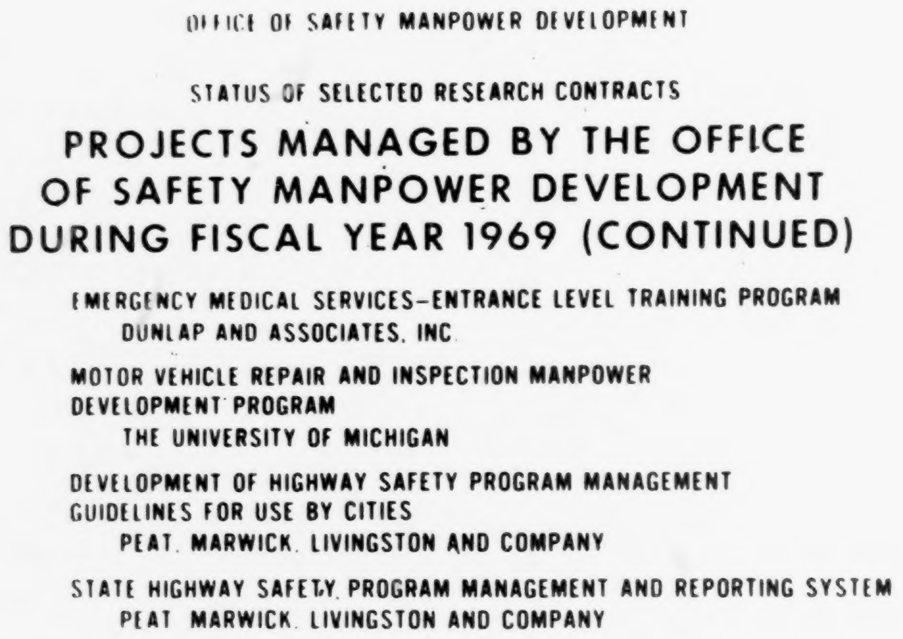
Fig. 28. Contract Management -- FY 1969.

This and the following two figures show manpower-related contracts which were negotiated during Fiscal Year 1968 and are being managed during Fiscal Year 1969. During FY 1969, the manpower development-related contract expenditures in this initial phase will total approximately $688,000. Provisions are being made for negotiating new contracts at frequent intervals during the current fiscal year as new manpower development needs are identified.

1. The Highway Research Board of the National Academy of Sciences has been awarded a contract to select and/or synthesize the instruments recommended by the four previous contractors for use in evaluating various types of driver education and training programs. The Academy will also develop plans for validating these instruments. The Educational Testing Service at Princeton is assisting the National Academy of Sciences in conducting this project. The principal investigator on the project will present additional information in another paper.

2. The Institute for Educational Development is conducting two symposia on driver education and training, one for public and non-public schools, and the other for commercial driving schools. The objective of the public and non-public school symposium is to report on the progress of selected programs in driver education and related fields and to contribute to the effective implementation of recent research findings in this field, with particular emphasis on public and non-public schools. The objective of the commercial driving school symposium is the same as the previous symposium, except that emphasis will be placed on commercial driving schools.

3. The Stanford Research Institute is conducting a study to determine the feasibility of establishing, on a nation-wide basis, a set of multidisciplinary centers for highway safety education and research within the framework of university-level educational institutions of complexes. The purpose of these centers is to produce personnel capable of dealing with the varied highway and traffic safety problems encountered at the Federal, state, and local government levels. The centers will also prepare safety research manpower. Alternative programs for meeting the nation's safety manpower development needs will also be considered by the Stanford research group.



OFFICE OF SAFETY MANPOWER DEVELOPMENT

STATUS OF SELECTED RESEARCH CONTRACTS

PROJECTS MANAGED BY THE OFFICE
OF SAFETY MANPOWER DEVELOPMENT
DURING FISCAL YEAR 1969 (CONTINUED)

EMERGENCY MEDICAL SERVICES–ENTRANCE LEVEL TRAINING PROGRAM
DUNLAP AND ASSOCIATES, INC.

MOTOR VEHICLE REPAIR AND INSPECTION MANPOWER
DEVELOPMENT PROGRAM
THE UNIVERSITY OF MICHIGAN

DEVELOPMENT OF HIGHWAY SAFETY PROGRAM MANAGEMENT
GUIDELINES FOR USE BY CITIES
PEAT, MARWICK, LIVINGSTON AND COMPANY

STATE HIGHWAY SAFETY PROGRAM MANAGEMENT AND REPORTING SYSTEM
PEAT, MARWICK, LIVINGSTON AND COMPANY

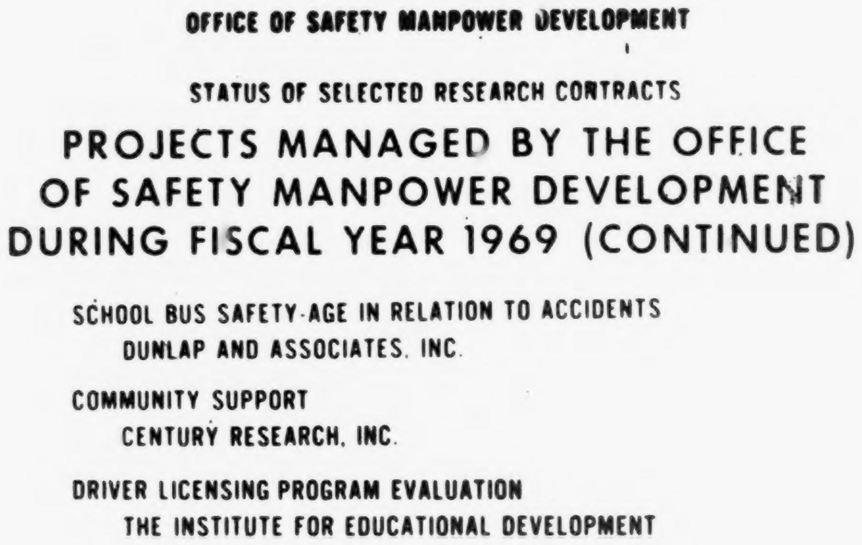
Fig. 28a. Contract management -- FY 1969 (continued).

4. Dunlap and Associates, Inc. is conducting a project to develop text materials, instructor manuals, lesson plans, and other specific materials required to establish a short-term course for training emergency medical service personnel at the entrance level.

5. The Highway Safety Research Center at the University of Michigan has begun work on a motor vehicle repair and inspection manpower development program. The purpose of this project is to identify key repair manpower parameters for motor vehicle repair and inspection personnel and to determine the influence of such factors as skill, manpower availability, and legal status on inspection systems design. The contractor will also develop and test a course of study in automotive mechanics at the entrance level.

6. Peat, Marwick, Livingston and Company is conducting a project to refine and disseminate State Highway Safety Program Management Guidelines developed during fiscal year 1968. The refined material will be used subsequently as a basis for developing similar guidelines for use by cities.

7. Peat, Marwick, Livingston and Company is also developing a management and reporting system which will provide for an efficient and effective flow of information between the state and local units of government, the regional offices, and the National Highway Safety Bureau, within the framework of legislative and administrative requirements. Both PML programs will provide the basis for a future training course for state and local program managers.



OFFICE OF SAFETY MANPOWER DEVELOPMENT

STATUS OF SELECTED RESEARCH CONTRACTS

PROJECTS MANAGED BY THE OFFICE OF SAFETY MANPOWER DEVELOPMENT DURING FISCAL YEAR 1969 (CONTINUED)

SCHOOL BUS SAFETY-AGE IN RELATION TO ACCIDENTS
DUNLAP AND ASSOCIATES, INC.

COMMUNITY SUPPORT
CENTURY RESEARCH, INC.

DRIVER LICENSING PROGRAM EVALUATION
THE INSTITUTE FOR EDUCATIONAL DEVELOPMENT

Fig. 28b. Contract management -- FY 1969 (continued).

In addition to these projects, members of my staff are managing contracts as follows:

1. School Bus Safety -- Operator Age in Relation to School Bus Accidents - Dunlap and Associates, Inc. A project designed to determine if age is a critical factor in school bus operation; and if it is, to determine upper and lower age limits recommended for school bus operators. The contractor will also develop and test a uniform reporting system for school bus accidents.

2. Community Support - Century Research, Inc. This project is designed to identify and evaluate the role and effectiveness of community support efforts in specific actual situations involving the implementation of selected highway safety program standards at the state and local levels.

3. Driver Licensing Programs -- Institute for Educational Development. The purpose of this project is to identify the elements of the driver licensing function to develop plans for evaluating the effectiveness of driver licensing programs, and to study sources of multidisciplinary assistance to driver license administration.

Much has been accomplished by the National Highway Safety Bureau since the traffic and highway safety acts were signed into law by the President on September 9, 1966. But, of course, much more remains to be done before we can expect to achieve a perceptible reduction in the nation's traffic injuries and deaths. Since there is no likelihood that any one approach will be sufficiently successful by itself, we must continue to do many things in as energetic and coordinated a fashion as possible.

We have come a long way toward identifying the parameters of the driver education evaluation problem, as well as other problems in this and related fields. We have identified alternate plans for pursuing various solutions. We are now focusing our attention on those plans which appear to offer the greatest promise of both short-term and long-term success.

Much work needs to be done. At least part of our problem lies in the inadequate existing procedures for exchanging information we do have available about driver education and its effectiveness, between the scientific and research communities and the practitioners in this field. We also lack a systematic method of feeding back the practitioner's thinking to the researcher. This symposium has been organized as one step toward improving communications in the field. I expect that this will be the first in a series of similar symposia to be conducted at frequent intervals in the future for the purpose of promoting an exchange of information among the National Highway Safety Bureau, government and non-government safety researchers, professional associations, and instructors and professors of driver education and training throughout the nation.

In our present conference we are interested in reviewing the "state of the art" in the field and discussing the various issues of vital importance to persons interested in improving driver educating and training programs. Workshops will be held to provide a forum for this information exchange. Some of the latest research findings will be presented and discussed. Hopefully, one outcome of our deliberations will be a better understanding of the views of interested individuals and groups who are working toward the common goal of improved program effectiveness.

On behalf of the National Highway Safety Bureau I welcome you to this symposium.

DRIVER EDUCATION AND TRAINING

Gilbert E. Teal
Chief Scientist, Dunlap and Associates, Inc.

Dr. Teal is Vice President and Program Director of the Center for Accident Prevention, Behavioral Sciences Division, Dunlap and Associates, Inc. He received his Bachelor of Science degree in civil engineering from the University of Maryland, and has done extensive graduate work at The George Washington University and New York University. He holds the following degrees: Master of Arts (safety education), Master of Administrative Engineering (safety engineering option), Doctor of Engineering Science, and Doctor of Philosophy (educational administration and supervision).

For over 25 years Dr. Teal has been associated with the Center for Safety Education, New York University. He has served as chairman of numerous sections and standing committees of the National Safety Council, including recent appointments on the research committee of the American Society of Safety Engineers, the Traffic and Transportation Conference, NSC, and on training committees of the Industrial Conference, NSC, and the National Industrial Security Association. He is the author of several books on industrial and traffic safety, and has held faculty positions at Purdue, Maryland, NYU and Norwalk Community College.

Dr. Teal is a Fellow of the American Public Health Association, the American Association for the Advancement of Science, and the Society for Applied Anthropology. He is a member of the American Psychological Association, the New York Academy of Sciences, the Veterans of Safety, and numerous other professional societies. He is currently listed in *Who's Who in the East*, *American Men of Science*, and *Who's Who in Safety*.

PURPOSE

The general purpose of the research was "to develop a concrete plan or plans for evaluating the effectiveness of current or proposed driver educational programs." This statement presupposes that it is possible and necessary to define the "decay rate or half-life" of driver education--that point at which the effects of driver education are replaced or superceded by experience. The question can be posed this way: What is the effect of 6 hours of behind-the-wheel training on the driving efficiency of an individual who drives 20,000 miles the first year?

For purposes of definition, the Request For Proposal indicated a typical state program as including the following:

1. Secondary school driver education programs
2. Teacher training and certification
3. Development of new techniques and devices
4. Regulation of commercial driving schools
5. Certification of commercial school instructors

6. Adult public and private training programs, including retraining, first time adults, and elderly adults

In our proposal, we further recommended the inclusion of an additional interest area, namely, motorcycle driver education and training. We also chose to look closely at programs for the professional driver and for government and military personnel, at violator courses, and at various other special-category courses to see if additional insights might be gained.

APPROACH

Basically, the following approach was undertaken in the conduct of the study. First, primary information sources were tapped to develop the broadest possible data base for making recommendations. This involved a comprehensive review of all aspects of driver education, pertinent educational research, and other related areas. Second, this information base having been established, evaluative methods and criteria (both previously used and study-generated) were tentatively identified. Third, alternative evaluation proposals were considered and weighed in terms of such factors as appropriateness, practicality, costs, and level of sophistication.

The methods and plans for evaluation developed for the present study were based to a large extent on information obtained from these primary information sources:

- First, a thorough survey was made of major aspects of the driver education movement, to establish the "state of the art" and to gain any insights which would be helpful in establishing evaluative criteria.

  While it was possible to accept with confidence the comprehensive information on secondary school driver education compiled and published by such organizations as the National Education Association, National Safety Council, and Insurance Institute for Highway Safety, considerably less information was available on other important areas. For example, there was found to be a definite lack of information on the status of commercial school driver education. It was therefore necessary to conduct a separate study to obtain information on the services, capabilities, practices, and policies of the commercial driving school industry, examine existing and proposed state legislation relating to commercial schools, and survey the curricula of commercial schools. To collect this information, two questionnaire surveys were conducted and numerous schools were personally visited by the research staff. One of the major conclusions drawn from this study was the fact that the long-standing friction that has existed between many of the proponents of secondary school driver education and the commercial school industry is one of the biggest detriments to the total driver education movement. This situation must be rectified in the immediate future if the driver education program per se is to make its major contribution to accident reduction on the highways of the nation.

A study was also made of other primary sources of driver education. These included programs for the professional driver, government and military programs, adult programs, improvement schools, violator programs, and special courses such as those for the aged and handicapped. This information was gathered primarily through mailings, telephonic communications, visits, and an extensive search of the literature. Additionally, we collected relevant data on the curriculum of some of the more widely acclaimed teacher preparation programs throughout the country.

One other area of driver education which will likely become an increasingly important facet of the total driver education picture in the next several years is that of motorcycle driver training. There was a general lack of information on this topic. Consequently, another separate survey was conducted to assess the status of motorcycle driver education courses in the United States and to get a picture of what lies ahead. The study indicated that only fragmentary attempts are being made to accomplish this type of training. There is a definite need for a well planned, unified approach to this problem.

- Second, a major source of information was a study made of methods of evaluation currently used in the field of driver education, such as the NSC's School Honor Roll Program, the Annual Inventory of Traffic Safety Activities, IIHS's Annual Driver Education Achievement Program and the National Student Traffic Safety Program.

  We looked also at pilot projects in evaluation, such as the 1966 NSC evaluation study of the Minnesota Traffic Safety Program.

  College and secondary schools have long been faced with the parallel problem of identifying characteristics which make a school program "good" and whose omission or insufficiency make a program "lacking." It has long been recognized that evaluation for purposes of school accreditation is a difficult matter because of the many differences in factors such as enrollment, physical facilities, environment, financial resources, abilities of students, community needs, teacher availability and qualifications, and program objectives--all factors which contaminate the evaluation system and make complete standardization impractical, if not useless. Through a gradual evolution by trial and error coupled with meaningful study, however, workable evaluation schemes have been developed. One excellent example of a carefully conceived and continuously revised evaluation program is that developed by the Cooperative Study of Secondary School Standards, now the National Study of Secondary School Evaluation. This evaluation system is widely used by secondary school systems across the country.

- Third, since accident reduction is obviously the ultimate measure of the effectiveness of any accident prevention program, a careful investigation was made of as many accident studies concerned with driver education as could be practically found.

- Fourth, a review was made of illustrative reports describing how cost/benefit analysis and other systems analysis techniques may be applied to evaluation problems of the type faced in the present research program. These techniques did not show much promise for the present problem.

- Fifth, to gain insights into the accident statistics currently recorded by the various states and to determine if they were in any way systematically related to driver education program variables, relevant records were obtained from various statistical sources and subjected to statistical analysis by the Dunlap research staff. In all, 43 variables were analyzed. This study failed to provide any significant new insights, and so is subject to most of the criticisms which have been levelled at previous studies.

CONCLUSIONS

- Accident statistics, which are presently maintained on a state-by-state basis, are inappropriate for meaningful evaluation research on driver education. Even attempts to derive relationships from existing statistics by "brute force" have been relatively unsuccessful.

- The significant variations among states with regard to the recording, compiling, summarizing, and reporting of accidents raise serious questions as to the reliability of most accident data. This makes the data base for nationwide evaluation studies, at best, suspect.

- Nearly all studies evaluating driver education in terms of accident experience have simply compared the driving records of a "driver educated" sample with an "untrained" sample. Little has been said about the type, scope, or quality of the training the educated group received. Additionally, little attention has been given to identifying program elements or variables which might account for the association or lack of association between driver education and accidents. Most program elements studied to date would not appear on the surface to have been particularly appropriate.

- The problem of the decay rate or half-life of driver education was described earlier. Additionally, it must be remembered that driver education is only a small part of the total safety effort. Before driver education can be given credit for accident reduction, its effects must be isolated from those of other traffic safety activities, such as traffic engineering, driver licensing, motor vehicle inspection, police supervision, and accident reporting.

- Previous research has also suggested that "non-program" factors, such as population, car density, climate, geography, miles of road, etc., may be associated with accident and death rates and consequently have to be considered in any program evaluation.

Numerous other contamination influences have been outlined in the Dunlap study, but need not be emphasized here.

In the light of these conclusions, it seems to the Dunlap staff to be inadvisable, at least from the standpoint of evaluating driver education, to continue the trend toward using more and more sophisticated statistical techniques in the study of accident experience until the data base is upgraded to a comparable level of sophistication. Cost/benefit analysis and the other "in" systems of analytical technique do not at this time appear appropriate for use in the present problem area.

ALTERNATIVE EVALUATION APPROACHES CONSIDERED

The studies just described gave the research staff the broadest possible information base on the "state of the art." It was then possible to consider alternative evaluation plans. The alternatives considered ranged from relatively simple, rather unimpressive approaches to highly sophisticated "in" systems analytical techniques. The goal was to recommend the most sophisticated approach consistent with other real-world considerations, such as cost, practicality, appropriateness, and manageability. Among the primary plans analyzed (not listed in priority order) were the following: enrollment appraisal, cost/benefit analysis, safety activity comparison, total resource analysis, student follow-up, review board, self-evaluation, program inventory analysis, National Driver Register data-bank approach, evaluative criteria approach, failure mode and effect, human error prediction, and "tree-analysis."

One other approach that was seriously considered early in the study was the testing of performance with simulators. This appeared to be excessively costly in terms of anticipated benefits, and not practicable from the standpoint of providing enough simulators to test a representative sample of the three to four million new drivers each year, plus an appropriate sample of the presently licensed population.

RATIONALE FOR DUNLAP'S EVALUATION PROPOSAL

Dunlap's short-range solution to the evaluation problem accepts the status quo; its long-range proposal anticipates a more utopian statistical workplace, with the first step being a major improvement in the statistical data base.

In light of this and after revieiwng all the considerations previously discussed, we recommend that the short-term program for evaluating driver education and training should be developed in accordance with the following plan.

Recommended Short-Term Evaluation Plan

The evaluation device which we recommend for use in the short-term program is an Evaluative Criteria instrument on driver education, originally developed by the National Study of Secondary School Evaluation.[1] I mentioned briefly earlier that the driver education Evaluative Criteria instrument was first introduced in 1960, although evaluative criteria programs for other study areas have been developed and utilized continuously since 1940. In reviewing evaluation approaches against needs for program evaluation, we have concluded that this particular instrument will serve adequately as a measurement tool for the short-term pilot effort. It has major advantages. It is already an acceptable part of the evaluation procedure for secondary schools. It has been field-tested for the past seven years and can therefore provide base-line data on past evaluations for many schools. It is self-administered by the schools and contains a check potential in the application of the visiting team technique. The instrument provides for the inclusion of information on organization, the nature of offerings, physical facilities, the direction of learning, the instructional staff, instructional activities, instructional materials, methods of evaluation, outcomes, and the special characteristics of the driver education program. It can be statistically scored on a weighting basis, and these scores can be used to compare across program areas, between schools, between states, and between one type of driver education program and another, since provision is made for partial scoring. And it is a device that is relatively simple and inexpensive to modify and refine without disturbing the continuity of the evaluation program.

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[1] *National Study of Secondary School Evaluation. "Section D-6" Evaluative Criteria - Revised edition. The Study. 1785 Massachusetts Avenue, Washington, D. C. 20036. 1960.*

The geographic area suggested for the conduct of the pilot evaluation is the six New England states of Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut. This small group of states contains a highly dense population and a complete galaxy of the various driver training programs of interest. The states have a current population of over 400,000 fifteen-year-old students, present in public, private, and parochial schools, including limited numbers in correctional institutions, orphanages, etc. Most of the secondary schools in this area already use Evaluative Criteria to evaluate their overall educational programs. This area includes examples of states having required driver education as a prerequisite to licensing, states using the secondary school-commercial school combinations of instruction, and states operating adult education programs and violator schools resulting from the point system application. It is a small geographic area, and the travel costs of researchers would be at a minimum.

It is anticipated that approximately three man-years of effort would be necessary to accomplish the New England pilot project, at an estimated cost of $105,000. This would include the field site visits, consultation with state officials, an analysis of program deficiencies based on the printouts supplied by the state departments, and the preparation of the operation manual and the final report.

Recommended Long-Term Evaluation Plan

We have previously indicated the problems of predicting the outcome of various on-going research activities sponsored by the National Highway Safety Bureau and other agencies, and it is therefore virtually impossible to predict the subsequent availability of data bases upon which to develop a long-range evaluation plan. There are certain obvious steps that must be taken before such a plan can evolve.

The paramount requirement is the establishment of state offices of record for persons completing driver education courses. This implies the need to have all driver education agencies establish a regular reporting program within each state, and the need to record such data in a state data bank. In order to provide a base of data for such a program, an interim step will also be required. The previously trained population will have to be queried in some form as to their driver education experience. This can be done most effectively by placing a question on the periodic application for renewal of the driver's license, and should serve as a mechanism for updating the state files in the course of the next three years. Thus, when a reportable accident occurs, a query of the data file will indicate whether or not an individual has received driver training, when, and in what manner. Present data on driver education students' accident experience are limited to a few research studies. There is no practical way to identify accident participants who have had or who have not had driver education courses. It is conceivable, based on on-going research, that such information may ultimately be included in the National Driver Register, but this is many years off. We therefore believe that the only step which can be recommended for a long-term evaluation plan is to develop the recommended driver education information base in the several states, at which time it would be possible to develop comparative evaluative studies.

OVERALL IMPRESSIONS ON DRIVER EDUCATION IN GENERAL

- One of the biggest detriments to the total driver education movement has been the long-standing friction that has existed between many of the proponents of secondary school driver education and the commercial school industry. This situation must be rectified.
- The limited-participation approach currently being experimented with by the Ontario Motor League and on a very limited basis in the United States, for instance in the state of Ohio, may deserve a closer look. It is in brief a scheme whereby driver education (the classroom phase) is included in the formal secondary school curriculum and taught by certified high school teachers, while the training phase (behind-the-wheel instruction) is handled on a contract between the school system and the commercial driving schools.

This approach may later turn out to be a highly practical one, and may even be more efficient from the viewpoint of educational objectives and skilled training by professional drivers. It may also be a sensible solution to the teacher shortage and to the training-car problem. It is an established fact that in most of the so-called professions (law, medicine, engineering, etc.), the preliminary formal educational programs, such as pre-med, are taught by trained educators, while the so-called professional courses are taught by professionals (doctors, lawyers, and engineers). A brief review of the recommended standards for driver education instructors indicates that there is not a major difference in the driving experience or qualifications required for secondary school teachers and for commercial school instructors, except with respect to the educational attainments stipulated for each.

- It has been pointed out by many people cognizant with the area of traffic safety that the curricular content and methodology of high school driver education has not changed materially from its original 1933 format. This the present investigators found to be true. Unquestionably, not enough serious attention has been given to the problem of curriculum planning and organization. We are hopeful that studies currently in progress will give us some new insights in this area.

- Motorcycle driver education will become an increasingly critical area in the next several years. To date, only fragmentary efforts have been made to structure courses in this area. The practical solution to handling the behind-the-wheel aspect of the training continues to be a fascinating challenge. Perhaps simulation will be a partial answer in reducing the inordinately high percentage of first- and second-ride injuries and deaths (20 percent of all motorcycle accidents).

THE SURVEY OF COMMERCIAL SCHOOLS

Gilbert E. Teal[1]
Chief Scientist
Dunlap and Associates, Inc.

The commercial driver training school industry is presently a primary source for driver education in the United States. Despite the fact that a substantial number of people are trained each year by commercial driver training schools, their roles and contributions have not been widely recognized. There has been an obvious, growing tendency, as evidenced in driver education literature, to equate "driver education" with "secondary school driver education." This apparent exclusion of the commercial schools would seem to have resulted from a combination of things. First, formal educators, recognizing that they have a vested interest in and responsibility for promoting driver education in the schools, have probably been more intense and more vocal in their approach than have commercial schools. Second, commercial schools typically have lacked the organization and resources necessary to have an effective voice in driver education matters. Third, commercial schools for one reason or another, have not been adequately represented in decision- and policy-making. Fourth, the industry has suffered a "bad press" because of the many sub-standard schools which have been permitted to come into existence and prosper unchecked as a result of the failure to pass appropriate and timely legislation for controlling and regulating the quality of schools. Fifth, there has been much friction between secondary schools, and commercial schools in recent years. And, finally, it is probably safe to assume that the profit motive has occasionally overridden some schools' interest in providing quality instruction.

PURPOSE OF THE STUDY

The Highway Safety Act of 1966 provides that ". . . the option for both students and adults to obtain driver training through private means should be available, provided the quality of the training is required to be maintained at a prescribed level."

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[1] *For biographical sketch see p. 236.*

In the light of this provision, and because there is a definite lack of information on the status of commercial school driver education, a separate study was conducted to:

1. Provide information on the services, capabilities, practices, and policies of the commercial driver training school industry.
2. Examine existing and proposed state legislation regarding the regulation and supervision of commercial school programs, particularly as the law relates to quality control.
3. Survey the curricula of commercial schools and review evaluation techniques presently employed by states and schools.
4. Identify sources of data on commercial school programs.
5. Develop a data base from which guidelines and recommendations can be generated for consideration, and for possible inclusion in the overall evaluation scheme.

DATA SOURCES AND METHOD USED

The major data sources used in this study were the state departments designated as responsible for regulating and supervising commercial schools, national, state, and local associations of commercial driving schools, and the commercial driver training schools themselves.

Initially, a thorough search was made of all available relevant literature on the topic. It was found that there was a general lack of information on commercial driver training schools and their education and training programs. Consequently, other methods of data gathering had to be employed to obtain relevant data.

A survey questionnarie entitled "Survey of State Practices and Regulations for Commercial Driving Schools" was mailed to each state and the District of Columbia. Completed questionnaires and/or program description literature were received from 48 states. In addition, copies of the rules and regulations, operator's manuals, and traffic laws were obtained where possible. Another questionnaire, "Commercial Driving School Survey", was mailed to every commercial school in the United States for which an address could be obtained. A mailing list of 2,880 schools was compiled through the cooperation of the National Professional Driver Education Association and the various state departments responsible for commercial driving schools. It was found that a substantial number of these schools were no longer in operation at the time of the survey. Three hundred and sixty questionnaires, or about 16 percent of the total estimated population, were included in the study sample. The distribution of responses by states is shown in Table II-1.

In addition to the two surveys, visitations were made to many research centers. Conferences were also held with several individuals cognizant of the problem and with interested organizations throughout the United States. Project staff members personally visited more than thirty commercial schools across the country, including several in the New England states, Virginia, Delaware, Maryland, Pennsylvania, New York, Illinois, Texas,and California. In-depth discussions were held at various times with officers and members of various state and local associations, as well as with officers of the National Professional Driver Education Association. Invaluable assistance was also received from the Motor Vehicle Departments of Connecticut, Massachusetts, New Jersey, and New York, and from the Pennsylvania Department of Public Instruction, which cooperated in the initial information-gathering phase of the study. The results of the study are briefly summarized in the following paragraphs.

RESULTS OF THE STUDY

Prevalence of Commercial Schools

At the present time, national statistics are not kept on commercial driver training schools. Until such time as more functional and uniform practices are adopted by the states, the primary source of information must be the industry itself.

On the basis of survey returns and the mailing lists generated for the study, it was estimated that there are roughly 2,200 commercial schools now in operation in the United States (excluding specialty schools for truck drivers, etc.), employing a probable 12,000 instructors, maintaining an estimated 11,300 training cars, and teaching somewhere in the neighborhood of one and three quarter million people

Table II-1: Estimated Number of Commercial Schools in the United States and the Responses Received, by State

State	Estimated Number	Response	State	Estimated Number	Response
Alabama	11	0	Nebraska	7	0
Alaska	2	1	Nevada	3	1
Arizona	13	0	New Hampshire	25	3
Arkansas	3	0	New Jersey	113	17
California	246	27	New Mexico	4	0
Colorado	9	3	New York	373	68
Connecticut	156	30	North Carolina	29	5
Delaware	4	0	North Dakota	0	0
District of Columbia	19	3	Ohio	128	24
			Oklahoma	60	0
Florida	53	10	Oregon	16	8
Georgia	10	2	Pennsylvania	200	34
Hawaii	16	1	Rhode Island	24	2
Idaho	3	1	South Carolina	23	2
Illinois	70	17	South Dakota	0	0
Indiana	12	2	Tennessee	12	3
Iowa	6	2	Texas	56	4
Kansas	4	2	Utah	6	2
Kentucky	15	5	Vermont	11	3
Louisiana	13	3	Virginia	8	0
Maine	26	7	Washington	26	4
Maryland	59	6	West Virginia	7	1
Massachusetts	200	32	Wisconsin	40	8
Michigan	82	7	Wyoming	0	0
Minnesota	21	3		2246	356
Mississippi	2	0	Unidentified		4
Missouri	20	3			360
Montana	0	0			

per year. This figure does not include branch schools and may not account accurately for unlicensed schools. It is the best estimate possible based on available information.

Commercial schools are now found in every state with the exception of Montana, North Dakota, South Dakota, Wyoming, and possibly Mississippi.(A breakdown of the estimated number of schools in each state is presented in Table II-1.) The heaviest concentration of schools is in the northeastern sector of the country. New York with 373 and California with 246 schools lead all states in the total number of schools. It is interesting to note that there are 156 schools operating in the State of Connecticut. This means that there is essentially one school for every 6,000 residents of legal driving age in the state. (The distribution of responses is also shown in Table II-1).

Services Provided

As a group, commercial driver training schools are involved in virtually all aspects of driver education. They teach all categories of students and give instruction in the operation of all types of vehicles. In addition to instruction for the beginning driver, commercial schools often offer special adult programs, special programs for the aged, the handicapped, and for the slow learners. They have in many instances been called upon to conduct violator schools or other types of improvement clinics. Some schools specialize in the evaluation of drivers, primarily for large commercial trucking concerns. Motorcycle driver education is also a rapidly growing service of many commercial schools.

In certain instances the services of the commercial schools have gone beyond that of providing driving instruction. For example, in Massachusetts certain commercial schools have been fully accredited as teacher training institutes. The requirements which must be met by schools in order to offer the instructors' courses are considered by the state to be quite comparable to those of area colleges and universities.

The majority of commercial schools, however, continue to concentrate their efforts on training the beginning driver. It was with this service that the survey was primarily concerned.

Table II-2 summarizes the primary services provided by the schools which participated in the survey.

Table II-2: Percentage of Commercial Schools Offering Various Driver Education Services

Type of Service	Classroom Offered*	In-Car Instruction
Beginning driver	76.9%	98.6%
Handicapped persons	43.4%	63.8%
Aged	55.2%	83.3%
Improvement or remedial	56.5%	81.9%
Commercial driver	24.5%	32.2%
Chauffeur	20.9%	26.5%
Motorcycle	6.1%	4.2%

* Since many states do not require the classroom phase of instruction in many of these categories, it is often difficult to support this activity profitably.

Time in Business

Each school was asked to indicate the year in which it was founded. Of those responding, only two percent had been in business less than one year, 25.5 percent had been in business fewer than five years, 3.6 percent had been in existence more than 30 years. Nearly 23 percent of the schools had been in business between six and ten years. Table II-3 gives a breakdown of the surveyed schools in terms of years in business. It can be argued that established schools might be more willing to participate in this type of survey, but in terms of experience and discussions with those who know, the above percentages seem reasonably representative of the industry.

The oldest school responding to the survey was established in 1925. Three other schools reported that they were founded in 1928. The earliest commercial school on record was begun in 1909, according to the National Professional Driver Education Association.

Table II-3: Distribution of Schools in Terms of Years in Business

Years in Business	Percent of Schools	
1 or less	2%	Cumulative
2 or less	8%	
3 or less	14.1%	
4 or less	18.6%	
5 or less	25.5%	
6 - 10	22.8%	
11 - 15	19.2%	
16 - 20	13.9%	
21 - 25	10.8%	
26 - 30	2.8%	
31 or more	3.6%	
no response	1.4%	

Branch Offices

Eighty percent of the schools indicated they had no branch offices, 8.6% reported one branch office, 4.7% had two branch offices, 3.3% had three branch offices, and 3.4% had four or more branch offices. The largest commercial school in terms of number of branch offices was fifteen. It is evident from the data that the commercial driver training school business is still predominantly one of small independent operations, although there are some rather large chains operating in the United States, such as Easy Method and the American Automobile Association schools.

Student Load

Each school was asked what its average monthly student load had been for the 12 months prior to the survey. Estimates ranged from a low of three students per month to a high of over 1,000 per month. Table II-4 shows the distribution of the monthly student loads of the schools in the sample.

Responses to determine the age and sex of the students indicated that 40 percent of the commercial school students were 25 years of age or older. Thirty percent were between 16 and 18 years. Twelve percent fell in the range of 19 to

20 years; 15 percent in the range of 21 to 25 years. Obviously, the percentage of students under 16 years of age was negligible.

Table II-4: Percentage of Schools Reporting Varying Monthly Student Loads

Number of Students	Percent of Sample
1 - 5	8.6
6 - 10	13.6
11 - 15	8.3
16 - 25	13.3
26 - 50	14.4
51 - 100	14.4
101 - 250	6.6
over 250	3.6
no response	17.2

Eighty-seven percent of the schools indicated that area high schools offer the complete driver education course to their students. In approximately 43 percent of the cases in which the complete course is not offered by local high schools, the classroom phase is offered. There was, however, no particular evidence that the monthly student load of commercial schools was substantially lower in areas where high school driver education programs were active. Of course, the data collected do not lend themselves well to this sort of interpretation. The fact that no relationship was evident may result from the fact that in large population centers commercial schools can probably expect a higher volume of business despite the fact that high school driver education may also be more active there. It must be remembered also that a substantial percentage of the study sample comprised schools located in Massachusetts, where secondary and commercial schools frequently cooperate in a "limited participation" program, the former providing the classroom phase of instruction and the later giving the in-car instruction.

In view of the many reports received from now defunct schools, attributing their business failures, in part, to the upsurge in high school driver education, one presumes that there is an effect. Some knowledgeable individuals stated that they though the recent drop in the total number of commercial schools may have been a result not only of stricter regulation, but also of the boom in high school driver education. The extent of this effect, if any, cannot yet be determined.

It would appear that a couple of things could be done to make more economical and efficient use of the driver education resources of a community. Either the high school program can be increased in scope and activity to the point where the commercial schools find it practically impossible to survive (at least in the area of beginning driving instruction) or the scope and activities of the secondary school driver education programs could be planned in such a way as to minimize redundancy or overlap by considering the availability of quality commercial schools which could share the burden and fruits of the student driving population. The latter, it would seem, is a more realistic and practical approach, assuming, of course, that the quality of instruction of the two sources was comparable. Whether or not this would or should entail state or Federal financial support to commercial schools is another question which would have to be answered ultimately. Perhaps an even more important question that would have to be answered is whether it is necessary that secondary schools be capable of meeting the total demand for the driver education service, and, if not, what criteria should be used for the selection process. A third approach is also possible; that is, continue, as we are, to let both commercial schools and secondary schools battle it out and let the chips fall where they may.

Schools Offering Complete Courses

Approximately 76 percent of the schools responding to the survey indicated that they offered the complete course; i.e., both classroom and in-car instruction. The remaining schools offered only the in-car phase. It should be kept in mind that several states do not yet require driver education, and consequently schools in these states may find it difficult to offer classroom instruction profitably.

Seventy-five percent of the schools claim to have separate classroom facilities. It is not possible from the responses received to determine if all these schools actually have classroom facilities on the school premises. It is known that in some states, such as New York, it is common for several schools to share a single classroom facility rather than for each to maintain one of its own. It is not known how widespread this practice is. Although the use of commercial classrooms is commonly criticized, it has not been established whether or not such use is actually detrimental to the education process. If it is not generally inconvenient for the student to get a communal classroom facility, this may just be one answer for getting better utilization out of the chronically shallow pool of qualified, certified classroom instructors. It may also be an easier way of standardizing instruction across schools. More investigation would have to be done before the merit of this approach could be fully assessed.

Each school was asked to describe how it typically scheduled the two phases of instruction. The greatest number of schools (51 percent) offer the classroom and in-car phases concurrently. Twenty-five percent offer the classroom phase first and then the in-car phase, 19 percent provide only in-car instruction and the remaining 5 percent indicated they have "other" scheduling arrangements. The most frequently mentioned "other" techniques were in-car lectures and in-car instruction first, and then classroom instruction.

Hours of Instruction

As a matter of interest, schools were asked how many hours of instruction the "average" student received. Practically without exception, schools reported that students received the minimum hours of classroom instruction required by their states. Several schools explained that the paying customer is not generally interested in attending classroom instruction over and above the minimum prescribed by law. A few schools reportedly even attempted to offer additional free classroom instruction, but have discontinued these programs because of poor attendance. While some schools felt there should be more classroom instruction, many indicated they thought too much attention was already directed to classroom theory and not enough time was spent giving in-car instruction.

Responses to the question of how many hours of in-car instruction students normally received varied between 6 and 30 hours as a rule. The average for the sample was 8.74 hours. The few schools in the sample which place great emphasis on the training of truck drivers and drivers of commercial vehicles were eliminated from this computation since these activities commonly involve from 80 to 100 hours of practice driving.

An additional inquiry was made to find out how soon commercial schools expose their students to heavy traffic.

Four percent said that students were exposed to traffic immediately. This is not always by choice, however, since schools located in densly populated areas often find it difficult to avoid traffic conditions. Twelve percent expose students after approximately one hour of in-car instruction and 23 percent after two hours. Over 84 percent of the schools reported that they expose their students to heavy traffic within the first five hours of in-car instruction.

Training Aids and Teaching Techniques

It was found that commercial schools typically use the standard training aids used by secondary schools in their driver education programs. Nearly all the schools offering the classroom phase use the standard textbooks, although a small percentage still center their instruction around state operator manuals. Sixty-eight percent of all schools reported that they use films and projection equipment; 70 percent use charts, graphs, and other visual aids regularly. Only 41 percent reported that they used mockups or models, and only 32 percent used psycho-physical devices. Among the other training aids most frequently mentioned were pictures and clippings, drivers' manuals traffic laws, notebooks, scrapbooks, and themes prepared by students; parts of cars, school published tests, and simulation equipment. Full scale driving simulators were used by only 2.9 percent of the schools sampled.

A survey of major manufacturers showed that there are probably fewer than two dozen commercial schools in the country which use driving simulators. As a general rule, commercial schools have adopted a policy against the use of simulators. The National Professional Driver Education Association suggests, for example, that it sees no need for the professional school to use simulators when they can offer the real thing.

Less than 8 percent of the schools used driving ranges. Only a very few schools own and maintain their own driving ranges, although several have agreements with community organizations to use parks, parking lots, and remote streets for this purpose or have permission to use driving ranges maintained by secondary schools, colleges, and other safety organizations.

Sixty-one percent of the schools do not permit student observers to ride in training cars while they are being operated by other students. The consensus among commercial schools is that student observation time is not beneficial and may, in fact, be detrimental to the learning process, especially if observation time is credited as part of the in-car training requirement. The majority of schools which indicated that they permitted student observers to ride in training cars were schools employing high school driver education teachers. This is not surprising in light of the fact that it is common practice in high school programs to use the student observer technique. The remaining schools were predominantly schools located in Massachusetts, where six hours of observation time is required by law. The relative advantages and disadvantages of student observation time have not yet been firmly established or tested.

Other commonly reported teaching techniques included the Smith System, defensive driving courses, visitations to traffic courts, police stations, and other relevant sites, guest speakers from various safety organizations and enforcement authorities, and closed circuit TV classroom instruction.

Instructors

Twenty-nine percent of the schools indicated they employed just 1 instructor, 42 percent between 2 and 5 instructors, 12 percent between 6 and 10 instructors, 7 percent between 11 and 15 instructors, and 5 percent had more than 15 instructors. Of all the instructors, 64 percent were full-time employees, and 36 percent were part-time instructors. The largest number of full-time instructors employed by a single school was 135. The largest number of part-time instructors was 60. The average number of full-time instructors per school was 3.61, and the average number of part-time instructors was 2. Sixteen of the schools indicated they had no full-time instructors.

In order to determine what the primary sources were for part-time commercial school instructors, each school was asked to list the primary occupations of their part-time employees. The most commonly mentioned occupations, not necessarily listed in order of frequency of mention, were the following:

- School teachers (driver education and other)
- Policemen
- Firemen
- Civil service employees
- Ministers
- College and graduate school students
- Commercial vehicle operators
- Housewives
- Social workers
- Salesmen and small-business operators
- Retired motor vehicle department employees
- Ambulance drivers
- Retired military personnel
- Utilities employees

It is interesting to note that a substantial percentage of those who become part-time driving instructors already drive as part of their primary occupation. A few schools indicated that all of their instructors are either retired policemen or retired motor vehicle department personnel. The most common source of part-time instructors was secondary school teachers and most often they were high school driver education teachers.

Tables II-5 and II-6 show the education and experience levels of the instructors sampled. While 97 percent of the commercial school instructors had high school diplomas, it was somewhat surprising to find that less than less than 25 percent were college graduates. The range of experience was great, although more instructors fell into the 2 to 5 year experience bracket than into any other. Nearly 21 percent of the instructors had more than 10 years of experience.

Since the great majority of schools responding to the survey were located in states which have instructor certification requirements, nearly all of the instructors included in the sample were certified. Certification will be dealt with in a later section.

Table II-5: Education Levels of Instructors in Sample

Level	Percent
College graduates	24.1
Some college	27.4
High school graduates	45.7
Non-high school graduates	2.8

Table II-6: Experience Levels of Instructors in Sample

Level	Percent
Less than 1 year of experience	14.2
1 to 2 years	17.1
2 to 5 years	30.1
5 to 10 years	17.9
Over 10 years	20.7

Classroom Phase, Curricula

The number of classroom topics listed by commercial school respondents was so great that it would be impractical to list them individually. There was a great deal of variation not only in course content, but also in the order of presentation and the time devoted to the coverage of major topics. Characteristically, however, the course descriptions included at least the following units or topic areas:

- The traffic problem
- Physical, mental, and emotional characteristics of drivers
- Laws of physics related to driving
- Traffic laws and rules of the road
- Construction, operation, and maintenance of cars
- Basic and advanced driving techniques
- Analysis of problems in traffic and on the open highway

- Special problems (alcohol, drugs, adverse weather, etc.)

Several schools reported that they now emphasize special emergency procedures in their classroom sessions. Some of the procedures are leaving yourself an escape route, evasive emergency action, recovery action, high-speed emergency braking, skids, crash analysis, and acts to minimize bodily injury and property damage when a crash is inevitable. Several schools also have highly structured courses which place major emphasis on particular skills such as the proper use of the eyes. In this category are courses like the Smith System and the various defensive driving programs.

In general, the commercial school seems to place more emphasis on the development of driving skills and habits and on teaching the rules of the road than on attempting to define and develop a good driving attitude in the classroom.

Commercial schools generally do a good job of coordinating classroom instruction and in-car instruction. This is sometimes difficult, however, since schools generally prefer to phase new students into a program even if it has already started, rather than to risk losing a customer by asking him to wait until the next course offering. In terms of accepted learning theory, this phasing-in policy has obvious shortcomings.

Commercial schools, for the most part, use the standard text books, Sportsmanlike Driving, Man and the Motor Car, etc. Many schools, however, have adopted The New Driver's Guide, developed by the National Professional Driver Education Association, as their primary text. In addition to lectures, students are typically given outside reading assignments, often have to prepare written reports or notebooks, and are asked to participate in debates and discussions on relevant topics. Classes are taken on field trips to traffic courts, safety centers, and police stations. From the responses to the survey it was not possible to determine the extent to which such innovative teaching techniques as programmed instruction and multimedia presentation are being employed by commercial schools.

In-Car Phase, Course Content

Like the number of classroom topics listed by the commercial schools, the areas covered by in-car instruction are too numerous for including in detail here. However, the outline below is a rather representative list of the topics most frequently reported by the respondents. For the sake of convenience they have been classified here into three categories: control, basic skills, and advanced skills.

Control

- Orientation
- Familiarization with driver's compartment
- Familiarization with controls
- Proper seating position and posture
- Starting and stopping
- Shifting
- Creeping

Basic Skills

- Turning from a stop
- Hand-over-hand turning
- Turns while moving
- Signals, hand and mechanical
- Backing, straight and weaving
- Backing around corners
- Turn abouts
- Starting on grades

Advanced Skills

- Normal driving conditions
- Highway driving
- One-way streets
- Downtown traffic
- Angle parking

- Parallel parking
- Overtaking and passing
- Preparation for license examination

Many of the outlines received were much more elaborate than this. Perhaps the most comprehensive and well thought out program reviewed was the one developed and endorsed by the National Professional Driver Education Association. Member schools employ a driver evaluation and progress report form which provides a student-status check on six categories of skills. These categories and the representative training received in each are described below.

Classification #1: Elementary Training
Basic orientation training in the use of the instrument panel, gauges, controls, and safety equipment, and training in simple maneuvers.

Classification #2: Intermediate Training
Turns, lane changing, intersections, etc.

Classification #3: Advanced Training
Backing, parking,expressway and highway driving, overtaking and passing, turnabouts, etc.

Classification #4: Expert Training
Standard shift, night driving, adverse weather, emergency driving, speed control, economy driving, evaluation

Classification #5: Area
Locations and traffic conditions under which student was observed

Classification #6: Weather
Exposure to various types of weather conditions.

The six-classification scheme described was based on the findings of a study conducted by the NPDEA over a period of several years. In the study, numerous seminars were held in which driving school owners from around the country participated,and driving school people met also with authorities and consultants from other organizations. Further information came from a 27-state survey of school owners, instructors, and consultants. The composite conclusions were published by the NPDEA in 1966, in a document entitled "Recommended Standards for Behind-the-Wheel Training." Briefly stated, the minimum training recommended was 31.2

hours of behind-the-wheel training without any theoretical instruction and 25.0 hours of behind-the wheel training with thorough theoretical instructions. Because there would be many practical limitations upon an attempt to implement such a program at present, the recommended behind-the-wheel program was ultimately reduced to 15.2 hours. Recommended minimums were also set for the number of miles that should be driven by students during the various phases of training. They were 7 miles per instruction hour for Classification #1 training, 9 miles per instruction hour for Classification #2 training, and 18 miles per instruction hour for Classification #3 and #4 training. No attempt was made during this investigation to determine how widely this program is used and how well it holds up in practice. In general, however, it appears to be well received by the membership of the NPDEA.

Because of many varied services offered by commercial driving schools, it is difficult for them to adhere to a simple program of instruction. While instruction for the beginning driver can generally follow a set format, commercial schools are also faced with problems such as the women who need to brush up on their parking, the elderly person who finds it necessary to drive because his spouse has died, the handicapped person, the court-referred violator, the foreigner, and the high school dropout who wants to train for a laundry route. In these instances, schools may concentrate their training effort on particular weaknesses rather than offer a standard course. These types of people may not only represent a problem in terms of their physiological makeup, but may also present unique problems from an intellectual, emotional, or motivational standpoint.

In summary, many excellent programs of instruction (at least excellent in terms of their face validity) have been set up by commercial schools. Many of these have been developed independently. The National Professional Driver Education Association program was a cooperative effort. Several schools indicated that they sought the help of notable professional consultants in developing their programs. One of the things which must be remembered in evaluating a program is that not only must it be comprehensive, but it must also be flexible. While it may be relatively easy to compare programs on the basis of course content, it may not be such an easy matter to determine which program is best meeting the individual needs of the particular students being served.

Methods of Program Evaluation

The schools were asked to describe briefly how they evaluated their driver education programs. Responses to this question varied greatly, from very crude indicators to quite elaborate techniques. A brief list of some of the methods described is presented below.

- Ability of students to handle car properly under all practical conditions
- Students' demonstration of good driving attitude
- Repeat business in families
- Demand for business
- Percent of referral business
- Study of accident records of past students
- Periodic follow-up surveys of past students
- Level of public interest expressed
- Recognition and approbation by law officials
- Formal appraisal by experts in auto safety and driver education
- Percent of students who pass state written and road test
- Grade average of students on state test
- School's reputation
- Profit
- Growth rate of school
- Number of students taught
- Volume of business compared with competitors' volume
- How program compares with competitors' programs

- Customer satisfaction: number of complaints expressed
- Violation records of past students and license retention rate
- Comparison with high school programs
- State requirements fulfilled
- How well program meets accepted educational standards
- Teacher evaluation
- Application of National Professional Driver Education Association Form AB-64
- A guide to D.E. Bulletin 395 (Evaluation)
- Success (license) guaranteed in X number of hours
- Constant review of program, and self-appraisal
- Suggestions by customers accepted and implemented, if good
- Ability to give personalized service and meet individual needs
- Course evaluation cards completed by students
- Parents of teenage students interviewed
- Years in business
- Experience and qualifications of school and instructors
- Hiring only college graduates as instructors
- Hiring former police and/or motor vehicle personnel
- Student performance on special school driving and written tests
- Self-appraisal of driving performance by students (formal system)
- Schedule flexibility: ability to provide instruction at the student's convenience

- Proper use of eyes by student while driving
- Guaranteed reduced insurance rates to graduates

Quality Control

Attempts to improve the quality of commercial-school driver education and training are being made within the industry as well as outside it. The primary method for internal quality control appears at this time to be the work of the professional associations. Some schools, however, explained that they were not happy with the progress being made by associations and were instead concentrating on improving their own programs. Approximately 50 percent of the respondents to the survey indicated that they belonged to commercial driving school associations. Forty-eight different state and local associations were represented in the sample. At least two national associations were represented.

Although the principle objective of most commercial school associations is the betterment of driver education and training, others have such stated or implied secondary objectives as mutual protection, improved competitive stature, and the sharing of classroom facilities. It appears from the survey results that no commercial school instructors other than those also teaching in the secondary school program were members of the American Driver and Traffic Safety Education Association. The specific reason for this is not known, but it would appear advantageous from the standpoint of the overall driver education movement to have commercial schools represented in organizations of this type. As stated elsewhere in this report, it is the opinion of the investigators that one of the major deterrents to driver education has been the lack of cooperation and communication between secondary schools and commercial schools. Both sides appear to be offenders. One healthy sign noted in the study was the fact that a prominent commercial school association in New York State is headed by a secondary school driver education teacher who, himself, is not a commercial school owner. Peaceful coexistence has to be achieved if the best interests of the public are to be served and if constructive headway is to be made in providing the best possible education to the greatest possible number.

The other way in which quality control must be maintained is through the enactment and enforcement of sound legislation. An inquiry was made concerning how the commercial schools view their state's rules and regulations. Most schools (64%) said they thought the rules and regulations of their states were adequately enforced; 28 percent felt they were not adequately enforced.

Survey of State Regulation and Control of Commercial Schools

A survey was conducted to determine the current status of state programs for commercial driver training schools. Questionnaires were sent to the responsible department in each state and the District of Columbia, requesting information on their rules and regulations pertaining to commercial schools, application requirements, teacher certification requirements, and the practices and policies of their department. In addition, a comprehensive library of current legislation was compiled and reviewed. The following section briefly summarizes the findings of this study. The discussion here is based almost exclusively on those states which regulate and control commercial driving schools.

State Offices Responsible for Commercial Schools

All states with the exception of 13 have designated offices responsible for the regulation and supervision of commercial driver training schools. There is, however, great variation among the states with regard to the specific offices they have selected for this purpose. Currently, commercial schools are the function of the Department of Motor Vehicles in 14 states, the Department of Public Safety in nine states, the Department of Education or Public Instruction in eight states, the Department of Highways in three states, and the Secretary of State in two states. In Idaho, the Department of Law Enforcement is responsible for the licensing and inspecting of commercial schools, although general responsibility for the regulation and supervision of the schools lies with the Department of Education. Michigan has proposed legislation which would make the Office of the Secretary of State responsible for commercial schools. The controlling office in the District of Columbia is the Department of Licenses and Inspections.

License Requirements

Nearly every state which has a designated office responsible for commercial driving schools requires commercial schools to be licensed. It was found that the great majority of legislation to this effect has been passed since 1957. All but 16 states have published rules or regulations pertaining to the conduct of commercial schools. A review of the survey returns and of the rules and regulations received during the study showed a general similarity of school license requirements in many states.

All states that license schools require them to make a formal application for a license. Every state indicated that there was either an application fee or a license fee. The amount of these fees varied from a low of $25.00 in several states to a high of $250.00 in Florida. Several states also have an "approval" fee which is assessed after a school has been granted a license. Some states have a single fee which covers branch offices as well as home offices, while others have additional fees for each branch office. Quite a few states do not require that the school location be approved before a license is issued. Although a few states have not designated a minimum age for license applicants, those which have, without exception, set the limit at 21 years of age. Nearly all states specifically require that schools have an established place of business. Less than half the states require schools to have a separate office and classroom. With but a few exceptions, nearly all states require training cars to be safety inspected as part of the licensing procedure. Half a dozen of these states do not ordinarily have a state vehicle inspection requirement. All states indicated they specify the minimum insurance to be carried on training vehicles, although there was a great variation in the prescribed limits of coverage. About half the states require commercial schools to maintain public liability insurance or a bond.

The same general requirements usually pertain to the license renewal procedure. Renewal fees generally range between $15.00 and $50.00. Except in California, where the renewal period is every four years, nearly every state indicated that a school license was valid for a period of one year.

Each state was asked the most common grounds for denying a commercial school a license. In order of frequency of mention, the reasons were as follows: failure to meet prescribed standards(including rules and regulations); inadequate school facilities; instructors not qualified or lacking sufficient experience; poor financial or driving records. The schools were likewise asked to list the most common grounds for revoking commercial school licenses. Many states reported that they have not yet had to revoke a school license. In those instances where licenses have been revoked, the most common reasons were fraud or misrepresentation, failure to comply with the rules and regulations, failure to maintain adequate insurance, and failure to maintain qualified instructors.

The survey responses showed that there has been a slow but rather continuous increase in the number of licensed commercial driving schools since 1962. However, as was stated earlier, there seems to have been a rather dramatic decrease in the total number of commercial schools during the same period. It is not possible to substantiate this decrease statistically, since formal records have not been kept on a nationwide basis.

ACCIDENT RECORDS

Each state was asked whether separate records were kept of accidents that occur during practice driving instruction given by commercial schools. Of the 22 states responding to the item, only one (Nevada) indicated that such statistics were compiled. During 1966 there were no accidents in Nevada involving student drivers under the supervision of commercial school instructors. It must be remembered, however, that there are only three licensed commercial schools in the state of Nevada. There is at present no estimate of the total number of such accidents a year in the United States.

SCHOOL INSPECTIONS

Most states reported that they reserved the right to have authorized representatives of their office make periodic inspections of commercial school facilities and instructional sessions. Generally, it was found that schools were inspected between one and five times a year, although in a few instances schools were visited as often as 12 times a year. In most states all or nearly all of the inspection visits are unannounced, while some states estimated between 50 percent and 80 percent as unannounced.

An inquiry was made to determine how many full-time commercial school inspectors were maintained by each state office.

In general, states reported that they had no full-time inspectors. Instead, the job of school inspection is usually an additional duty for office personnel. Few states indicated there are any special educational or training requirements for becoming a commercial school inspector. Those states which did list requirements seemed to place more emphasis on experience in driver education. In most states it is not required that inspectors even complete a driving instructor's course. It would seem that there is a need to look more closely at this aspect of the enforcement procedure, since it is believed that inspections, if conducted in a constructive manner, can play a critical role in upgrading the quality of commercial school programs.

CONCLUSIONS

- There is a general lack of published material on the subject of the commercial driver training industry.
- Other than a few statewide studies comparing statistics on the accident, fatality, or violation rates of relatively small samples of students who have completed secondary school and commercial school driver education courses, meaningful studies on the effectiveness of the commercial school in promoting and accomplishing driver education objectives are practically nonexistent.
- One of the greatest detriments to the total driver education movement has been the long standing friction that has existed between many of the proponents of secondary school driver education and the commercial school industry. This situation must be rectified.
- The not-too-distant past of the industry was marked by a general lack of organization, communication, and cooperation among commercial schools. Significant progress is being made by local, state, and national associations, and by other means, towards changing this situation.
- Commercial schools have generally lacked representation and a voice in driver education matters.
- The enactment of state legislation for the regulation and control of commercial schools has been very slow and in fact, such legislation does not

yet exist in several states.

- There is apparently an increased interest and involvement on the part of the commercial school industry in the legislative process. Indeed, many sensible programs are being proposed by the industry which will, if enacted, do much to upgrade the quality of the driver education provided by commercial schools.

- There are substantial differences in the type and quality of state programs for commercial schools. One reason for this is the fact that the many different kinds of departments which have been charged with responsibility for the supervision and control of commercial schools have varying interests, and often emphasize these interests to the virtual exclusion of other important considerations.

- States have, in many instances, gone to great pains to control and regulate commercial schools administratively; however, there has been considerably less attention given to the educational aspects of their programs. Supervision and evaluation of course content, teaching techniques, teacher qualification and certification, etc., seem to have been matters more implied than demonstrated.

- It was not the purpose of this study to evaluate specific programs. However, it must be kept in mind that legislation, regulations, and rules must be evaluated not only in terms of their apparent intrinsic worth, but also in terms of how well they are enforced.

PROBLEMS OF THE COMMERCIAL DRIVING SCHOOLS

H. B. Vinson, Past President
National Professional Driver Education Association

Mr. Vinson, who is past President of the National Professional Driver Education Association, Inc., has devoted the past 31 years of his life to the betterment of the Traffic Safety Program. His first assignment in this regard was working in the Engineering Division of the Texas Highway Department. He served in this capacity for a period of three years (1938-1941).

In 1946, he opened the first driving school in Texas. He has operated the school as a full-time occupation since 1946. By 1952, many driving schools had sprung up across the state of Texas, and Mr. Vinson formed the Texas Driving School Association. He was elected president of the group and served in this capacity until 1964, at which time he was elected President of the National Professional Driver Education Association.

From 1960 through 1968, Mr. Vinson traveled over the United States and Canada, assisting leaders of the National Professional Driver Education Association in organizing state associations and conducting workshops and seminars for the driving school industry. He has served on numerous committees designed to deal with specific problems of the driving school industry. From 1966 through 1968 he has worked closely with the members of the National Highway Safety Bureau in developing recommended standards for driving school programs.

Mr. Vinson attended Sul Ross State Teachers College in Alpine, Texas, where he majored in education. He has attended numerous special courses relating to the field of traffic safety and driver education.

The problems of the commercial driving schools are quite numerous and began when the first driving school was founded in Springfield, Massachusetts in 1909. The major problem as described by Mrs. Fairbanks, the present owner, was finding people who needed to learn to drive the automobile. Basically, the course consisted of nothing more than teaching the students how to start the automobile and providing them with the necessary knowledge relating to the maintenance and upkeep of the vehicle. Needless to say, the driving school was nothing more than a mere sideline activity for the owner.

As the years passed, other individuals could see the need for a service designed to teach people to drive the motor vehicle which was appearing (in alarming numbers) on the streets and roads. However, the demand for this service was not sufficient to justify the service of an individual on a full time basis. Consequently, schools were run on a very limited and part-time arrangement. By 1930, there were many driving schools scattered throughout the nation, with no regulations whatsoever controlling their activities. An individual who was unable to find employment elsewhere could usually open a driving school with very little investment and could manage to make a meager living, providing he was located in a large city. It is doubtful that any of the pioneers of the driving school industry received any type of formal training. As a result, each instructor taught what he considered essential to the students and charged any fee that seemed appropriate. Most of these courses were designed to teach the student nothing more than how to pass the qualifying test to obtain a driver's license.

Following the end of World War II in the mid 40's, there was a noticeable increase in the number of driving schools in most states. Once again the school owners were operating without any laws or regulations within their states to control their activities. The trend continued, as the market expanded, to teach the students only how to obtain a driver's license. By the same token, many such schools were open on a part-time basis with the owner devoting most of his time and energy to some other occupation. Learning better methods of teaching was of little concern to them. The most noticeable group appeared to be policemen and school teachers who taught during their time off from their regular work. Usually they established office facilities in their homes which enabled them to open a business with little or no additional overhead.

By the mid 50's, there were many driving schools in operation and only a few states had taken the time to enact laws or regulations controlling driving schools. The driving school owners were completely disorganized and had few guidelines to follow or constructive recommendations to offer when legislative committees were meeting for the purpose of passing bills relating to the schools. On many occasions, the driving school owners were their own worst enemies during such discussions and created a very poor image for the industry.

On or about 1950, a national magazine published a feature story entitled "The Driving School Racket." This article described in detail how the driving school owners conducted their business in an unscrupulous manner. It listed numerous examples where widows and other unfortunate people had paid large sums of money in an attempt to learn to drive and had received very little instruction in return. Their complaints were usually futile inasmuch as there was no regulation controlling the instructors activities and the individual had no legitimate means to regain the money spent on such instruction. The article further stated that school owners on the Eastern seaboard were charging fabulous prices to immigrants and others in order to help them obtain a state driver's license. It alleged that the school owners had engaged in a conspiracy with the driving license examiners in which the examiner received a certain fee for passing the applicant on a driver license test. In all probability, the author of this article had obtained facts to substantiate his claims and allegations. Nevertheless, the article left no doubt in the reader's mind that all driving school owners were questionable characters. The effects of this article on the public were felt throughout the nation by all conscientious and legitimate driving school owners.

Another publication released in the 50's was a cheap paperback book entitled Sin on Wheels. This booklet was sold throughout the nation in drug stores and book stands. The cover showed a driver training car parked in the background while the instructor was passionately attacking his female student in a clump of bushes nearby. Of course, the story was fictional, but the pages were filled with stories relating to the many love affairs of the driving school instructor. Furthermore, it stated that the majority of the women coming to a driving school were lonely and chose this method of finding male companionship. Articles such as this made a very noticeable contribution toward creating an extremely bad image in the public's mind toward driving schools and driving instructors.

In the mid 40's the high schools throughout the nation were launching a campaign to include driver education and driver training as part of their regular curriculum. Most of the automobile manufacturers agreed to provide to the schools, through the local dealers, free automobiles to use in their training programs. In addition to providing automobiles, the companies established or expanded safety education and traffic safety departments within their organizations. The objective of these programs was to assist states and schools in the implementation of the driver education program. The same vehicles used for the regularly enrolled students were also available for use in training adults, provided the schools offered driving education courses to adults. The schools accepting these vehicles had no problems relating to maintenance of the vehicle or disposition of it when it could no longer be used in the program. They merely returned the vehicle to the dealer and accepted another new one.

In the past, driving school owners have experienced difficulty in finding a dealer who was willing to give them a reasonable price for a car which had been used for driver training. The dealers are inclined to place such cars in the same category as used taxicabs. However, they do not seem to consider cars used in the high school program as being abused or mistreated. A good example of this practice is recorded in the laws relating to Basic Requirements for Obtaining a Connecticut Certificate of Title to a Motor Vehicle, State of Connecticut - Department of Motor Vehicles, dated September 29, 1966, Page 3;

> *10. Driver Education Vehicles:*
>
> *(a) When a dealer transfers a motor vehicle to a Board of Education or other recognized educational agency and the vehicle is to be transferred back to the dealer at the completion of a driver education course, no Certificate of Title need be applied for even though the vehicle is registered in the name of the educational unit.*
>
> *(b) The Statement of Origin is to be retained by the dealer and when sold, the vehicle is to be registered as "new" with the Manufacturer's Statement of Origin furnished as proof of ownership. This is by agreement between the dealers, State Board of Education, Connecticut Motor Vehicle Department, the towns and various insurance companies. There is no true transfer of title as is required by Section 14-169a. (Opinion from Office of Connecticut Attorney General).*

It seems utterly ridiculous that a group of law makers and safety minded individuals would condone such practices as described above. The public should not be deceived nor misled regarding the background of an automobile when purchasing it from a dealer. The general consensus usually is that an automobile described as being "new" has not been driven or used prior to the sale or transaction. The mere fact that the vehicle has been used to train high school driver education students should be no exception to the rule. This practice protects the dealer from taking a loss on the vehicle and is probably designed as a motivating factor to encourage him to participate in the high school program. I can not visualize any dealer giving such consideration to a driving school owner who was using the vehicle for the same purposes as the local high school.

Although the dealers are willing to furnish the vehicles for the school program, few of them are willing to provide the necessary liability insurance coverage for the protection of those who might become involved in an accident or mishap. All driving schools which are controlled by laws and regulations, are required to maintain liability insurance on the vehicles for the protection of the public. There seems to be no established policy within the states regarding even a minimum amount of liability insurance on high school driver education cars. I call to your attention a form used by one high school in Texas, which is self-explanatory. The following quotation has been taken from the standard application form:

> *The above named school has my full permission to enroll my (son, daughter, ward) in a course of driver instruction on the streets and school grounds of this City, and I hereby waive any and all claims against the ____________ High School and the School Instructor for any injuries to said pupil or any damage to property which might result from participation in said course, and further, I assume full responsibility for any and all damage to any person or any property which results from my said child's negligence while participating in the said course, and I expressly agree to hold ____________ High School, its successors and assigns, officers, agents and employees, harmless from all claims for any such damage.* (1)

A good example for the need of liability insurance on a high school driving training course was an incident which occurred in Ontario,California, on March 6, 1967. Mr. Garland Rogers, a driver education teacher from Fontana, California, was killed, and four students were seriously injured as a result of a traffic accident occurring while Mr. Rogers was teaching the students how to drive. I do not know the status of the insurance coverage of the vehicle involved. It would be a pathetic situation indeed for the families of all parties involved if this vehicle did not have the necessary insurance coverage.

Any driving school owner of sound mind would refuse to put a driver training car on the streets without proper insurance coverage. The public should demand the same protection for all cars used for such purposes, regardless of the sponsor of the program. Furthermore, it would appear that such action would create a very poor attitude in the mind of student drivers who knowingly are permitted to drive such uninsured vehicles in states where financial responsibility is required of other motorists. The cost of the premium of liability on high school driver training cars would substantially increase the cost of the course. It seems to be the objective of most high schools to offer these courses at a very modest figure. Driving schools are usually charged an exorbitant rate for such protection. It is difficult for these schools to compete with high school teachers using free cars without any additional expenses. The greatest problem of the driving school owners are the high school teachers "moon lighting" or teaching both teenagers and adults for a fee which they keep for themselves. Needless to say, the same cars are used for this purpose.

A report released by the Auto Industries for Highway Safety (2), reveals that there were 25,719 automobiles used throughout the nation in the high school driver education program. Of this amount, 23,339 were provided free by the local dealers. This figure represents 91% of the total amount of cars in use. The conclusion reached by anyone who cares to study this report would make it apparent that the high school driver education program is totally dependent on automobile dealers in order to continue the programs. It would seem logical that the automobile manufacturers, through their safety organizations, are in a key position to be very instrumental in establishing policies and procedures to all such schools who were indebted to them for the free use of their vehicles.

Driving school owners have never asked nor expected to receive free automobiles for use in their driver training programs. It would seem worthy of consideration that the automobile manufacturers would encourage students to learn to drive either in a high school driver program or in a private driving school. In all of the advertising and promotional material produced by these automobile manufacturers, they repeatedly stress the importance of obtaining driver education and training through the high school programs only. The one exception to this rule is the Ford Motor Company, which for years has printed pamphlets urging students to learn to drive in the high school program or at a professional driving school. The driving school industry is indeed grateful to the Ford Motor Company for this consideration. Furthermore, the Ford Motor Company has made available to the private driving school, all of its film and material on the same basis as it has been given to the high school program.

The Traffic Safety Act of 1966 made provisions for the purchase of the necessary equipment to be used in the driver training programs. It seems odd that more school districts have not utilized a portion of their allotment for the purchase of vehicles to be used in their schools.

The free advertising, promotion, and support for the high school programs by the automobile manufacturers have in the past and will continue in the future to create problems for the driving school owners.

In 1966 when Congress was conducting hearings preceding the passage of the Traffic Safety Act, members of the National Professional Driver Education Association testified before the Interstate and Foreign Affairs Committee. During this testimony, we stressed the importance of strengthening the driver license tests and making a concentrated effort to improve all driver education and driver training programs, both in the public and in the private driving schools. Also, we stressed the importance of rigid rules and regulations controlling driving schools. Fortunately, the law makers included these points in the final bill.

Immediately after the passage of the bill, various groups engaged in a campaign to reproduce certain portions of the bill and circulate their version to the various officials in each state. The National Safety Council produced a rather lengthy article and labeled it "A Summary of Congressional Intent." (3) You will note on page 5 of this article that all of the language relating to the commercial driving schools has been omitted. After reading the article in its entirety, it is interesting to note that driving schools do not appear anywhere. This act could or could not have been intentional. Nevertheless, we were informed on one occasion that we were not mentioned or intended to be included, nor participate in the newly organized Federal program. The speaker on this occasion was relying on the article published by the National Safety Council as the source of his information. Such actions as this created additional problems for the driving school industry.

After the Federal standards had been written, the NHSB embarked on the task of writing the guideline manual for the Driver Education Programs. On September 10, 1967, the first preliminary draft was released to state officials and other interested groups. On page 16 of this draft, we found the following statement:

> *Commercial and private driver training schools should offer driver training to anyone qualified to obtain a driver's license who is not enrolled in Grades 10 through 12 in a public or private secondary school.*

This statement caused the driving schools throughout the nation many problems. Even though it was only a preliminary draft, nothing further was released by the NHSB to the state officials until April 1968. By this time, many states had used the September draft as a recommendation of the Federal Government while attempting to comply with the provisions of the Highway Safety Act.

We held numerous meetings with the proper authorities of the NHSB and offered recommendations for the revision of the initial draft. The authorities appeared to be in sympathy with our cause and assured us it was not their intent to discriminate against the driving school industry. However, subsequent drafts of the manual continued to be confusing and always implied or stressed that instructors teaching teenage drivers should possess a teaching certificate. Furthermore, they attempted to convince us that this was the intent of Congress when the Highway Safety Act was written. Having no other alternative, members of our association appealed to their Congressmen and Senators, asking for clarification of this issue. In June, 1968, Dr. William Haddon was asked to attend a meeting called by the Legal Counsel of the Public Works Committee, House of Representatives. On June 7, 1968, Dr. Haddon released a notice to all governors clarifying the issue as to who the commercial driving schools could teach. The following is a reproduction of Dr. Haddon's letter:

> *Following is a restatement of the National Highway Safety Bureau's position in regard to training of motor vehicle operators by commercial driving schools. It is intended to clarify several issues which have been recently raised by the National Professional Driver Education Association.*
>
> *The NHSB has been assigned the responsibility to carry out the provisions of the Highway Safety Act. Clearly, the Act specifies that all facets of State highway safety programs will be administered through the Governor's office in each State. In line with this provision, the adopted standard on driver education and training leaves the minimum requirements for licensing of commercial driving schools and their instructors to the State governmental agency that has been given such authority by either a legislative or an appropriate administrative process.*
>
> *It is recognized that over the past few months several versions of a draft manual on driver education and training have been given limited distribution for comment by States, organizations, and individuals. In such cases it was made clear that the draft did not necessarily imply that the National Highway Safety Bureau would publish the final manual in that form. While several States may have taken action on statements made in a draft manual, such action can only be a State responsibility. The National Highway Safety Bureau does not bear responsibility for such decisions within a particular State or States.*

> *There appear to be two major issues which concern the commercial driving schools. The first is related to standards for licensing of their instructors. As previously indicated the NHSB has not proposed rigid rules for the States to follow in regard to criteria or qualifications of instructors either in commercial driving schools or in the public sector. The most recent draft manual on driver education and training does, however, suggest certain minimum qualifications for instructors. These are, however, only recommendations.*
>
> *The second issue that concerns the commercial driving school industry involves who commercial driving schools may instruct. The intent of the law, as reflected in House Report No. 1700, is that opportunities should be available for youthful and adult drivers to seek driving instruction at public and/or private facilities. The NHSB, in its standard and draft manual on driver education and training, has not placed a restriction on who commercial driving school instructors may teach.(4)*

On June 25, 1968, the Committee on Public Works, House of Representatives, released a report together with the minority views of the Committee. On page 7 of this report, the following paragraph appears:

> *One of the few problems that has developed in some areas concerns driver education, and that is a matter of misinterpretation. The House committee report on the Highway Safety Act, made it clear that State-regulated commercial driver training schools should be included in the driver education program. Both the report and the discussion during the debate in the House, should have made it clear that the licensing of instructors in commercial driving schools does not require the same qualifications that the certification of teachers in the public school system would require. (5)*

These two articles should leave no doubt that it was not the intent of Congress nor the NHSB to require teaching certificates for instructors of private driving schools, and in addition, that state licensed driving instructors should be qualified to teach anyone eligible to receive a driver's license.

The standards on driver education explain that driving instructors should be certified in accordance with specific criteria adopted by the State. This statement does not imply or suggest that the requirements be the same as instructors in the high school programs. We hear the arguments that all programs should be the same within the State or we should adopt the single standard concept. In most states this would apply to the instructors requirements only inasmuch as nothing else appears to be the same in the two programs.

Past experience has proven that the certified teacher is not as desirable in the private driving schools as the teacher without this certification. We have found that the courses conducted by colleges and universities are not adequate to prepare teachers to instruct in the professional driving schools. Consequently, the first thing a driving school owner must do is train the individual how to teach the student in the car. It would seem logical that the school owners in each state be allowed to train their own instructors, following a recommended course approved by the appropriate State agency regulating the driving schools.

The single standard policy would hinder all state programs. Most states are having difficulty finding enough teachers to teach in the high school programs. Some of them are using teachers aides who are not college graduates. To require driving schools in the same states to use only certified teachers in the teenage program would appear utterly ridiculous when the high schools are not requiring this certification in their programs. This approach in the state programs will continue to lower the quality of instruction offered in the driving schools and will continue to create many problems for the driving school industry, which is forced to comply with this requirement.

For the past thirty-five years we have been forced to live with the thirty hour classroom and the six hour driving courses for the teenage drivers. Year after year we continue to force this pathetic course on the young drivers. The content of the classroom course of instruction shows little variation year after year. The six hours of instruction in the car might or might not have been adequate in 1933. With the many complex problems encountered in today's traffic the 30 + 6 course is not only inadequate, but it is not appropriate to train a student properly to be a safe and careful driver.

Recently, the Insurance Institute for Highway Safety released a pamphlet showing a summary of "Student Participation in Driver Education", for the school year 1967-68.(6) In this summary, it was pointed out that three states were given the rating of "excellent." This rating was because of the fact that they had successfully taught more than 90 percent of all eligible high school students the "30 + 6" course. These states were Michigan, North Carolina, and Idaho. Michigan and North Carolina each taught 100 percent of all eligible students in their state, and Idaho taught 98 percent of all eligible students. It is interesting to note the traffic fatality records of these states as recorded by the National Safety Council in the December issue of "Traffic Safety." Michigan had a 23 percent increase in traffic deaths, North Carolina had an 11 percent increase, and Idaho had an 18 percent increase.

It is interesting to compare these figures with other states which taught only a small percentage of the eligible students. Massachusetts taught only 39 percent of their eligible students through the high school program, Tennessee taught only 24 percent of all eligible students, and Rhode Island taught only 3 percent of their eligible students. Again, comparing this report with the December issue of "Traffic Safety," we note that Massachusetts experienced a 10 percent reduction in traffic deaths and Tennessee experienced a 12 percent reduction. Rhode Island, teaching the smallest amount of eligible students the "30 + 6" course, leads the nation with a 26 percent reduction in traffic fatalities.

It would appear from these figures that states offering the least amount of the "30 + 6" courses are making a noticeable reduction in the traffic fatalities within their states. This could be nothing more than a coincidence. However, it is certainly worth some thought and consideration, and possibly these figures express more vividly than I am capable of doing, the true value of the "30 + 6" course as it is being administered at the present time in the high schools throughout the nation.

If there is any importance in the facts revealed by these two reports, we are indeed fortunate that only three states in the nation were good enough to be given the rating of "excellent" by the Insurance Institute for Highway Safety.

It is a well known fact to the public that six hours of driving is all that is required in the high school programs. Driving school owners know that you cannot properly train the average student in this limited time. They are forced to omit part of the course or skim over all phases lightly, which usually results in a partially trained driver who is confused on many points. Students are usually reluctant to pay for more training than the minimum requirement within the state program. The act of forcing driving schools to compete with the high schools who offer these courses creates many problems for the driving school industry.

New students enrolling in a course of instruction to learn to drive usually have one objective in mind. This objective is to learn nothing more than how to pass the state test in order to obtain a driver's license. There seems to exist in the minds of these individuals a feeling of security once they have learned to drive well enough to obtain a driver's license.

Driver's license tests do not vary to any noticeable degree within the various states. The test routes are designed to keep the applicant away from heavy traffic and off the freeways or streets where they are forced to drive at a high rate of speed. The average time of the driver's license test is 10 - 15 minutes per applicant. It is most difficult for a driver's license examiner to make a true evaluation of the applicant's ability to drive safely on this limited course within this time element.

One of the most frequent questions asked the driving instructor is: "How much time will it require in order for me to pass the test for my driver's license?" It is difficult for the instructor to ridicule or criticize the driver's license examination since such examinations are conducted by state employees and have the blessings of the state department responsible for administering such tests. Most qualified instructors could teach the average student how to pass the driving test with 4 - 6 hours of instruction. Conscientious school owners are not satisfied with graduating this type of student from their schools. As a result, the instructor must explain to the student that the driver's license test is only a minimum requirement and is not sufficient to qualify them to drive a motor vehicle under all traffic conditions. Past experience has proven that is is difficult to convince a student that he needs additional training once he has passed the state test and has obtained a driver's license.

Since the passage of the Traffic Safety Act of 1966, many states have revised their driver's license program. These revisions include requiring birth certificates of all applicants, a photograph of the applicant on the license, and a concentrated program to deal with the problem drivers. To my knowledge, none of the states have taken any action to improve the quality of or to strengthen the examination given to the applicant when he applies for his original driver's license. Such inadequate tests will continue to create additional problems for the driving school owners and instructors.

What was the intent of Congress when it passed the Highway Safety Act of 1966, as it related to the driver education and training courses? First, it required a significant expansion and improvement of all existing programs. Equally as important, it required an evaluation of past and present programs.

Most states have engaged in a campaign to expand the high school driver education program. Little has been done to improve the type of instruction offered to the students in these courses. There have been many surveys and studies made to determine the effectiveness of the driver education programs, but little action has been taken to change, revise, or improve them. It would appear that one of the greatest weaknesses to date has been the lack of action to improve the status quo after an evaluation has been made of the existing conditions. It seems logical that the time has come for conscientious state officials to take a second look at their present programs and to make a dedicated effort to improve the quality of instruction offered rather than to seek ways and means of expanding their programs and offering the same obsolete instruction to more and more students who are receiving less and less from such accelerated courses.

Report No. 1700, from the Public Works Committee, House of Representatives, which accompanied the Highway Safety Act of 1966, made it clear that driving schools should participate in the program, and that the public should be given the option of receiving driver education and training in the private schools as well as the public schools. The following statement has been taken from Report No. 1700, page 9:

> *In addition to the driver education courses given in public schools, privately operated commercial driver training schools exist in most States and are controlled by regulation in about half of the States. Obviously, the option for both students and adults to obtain driver training through private means should be available, provided the quality of the training is required to be maintained at a prescribed level.*

In this report, Congress attempted to make it clear that the public should not be forced to accept only one type of training program in their respective states. Later, the minority report of the Public Works Committee stressed the fact that their intent was not to require the same standards for instructors in high school programs as were required in the driving school programs. It would appear that it was not their intent to establish single standards in all programs.

The most ironic aspect of requiring that all programs be the same in each state is the inability to evaluate the programs adequately. By having only one program and one set of standards, we will never be able to determine the true value of the program, since we would have nothing to compare it with. In the past the driving school owners have had little opportunity to be instrumental in establishing policies in their states. Most often when a study was made of the existing programs, it was conducted by staunch supporters of the high school program. As a result, they were reluctant to point out or criticize the weaknesses of the programs.

Brigadier General Richard E. McLaughlin, Registrar of Motor Vehicles, Commonwealth of Massachusetts, made the following statement during a presentation at the International Driving School Conference in New York City, November 8, 1968. In his presentation, General McLaughlin gave his personal evaluation of the two programs in the state of Massachusetts based on his past observations and experience while working closely with both groups:

> *Massachusetts has a teenage program which really has its beginning back in the primary grades of our school system where practically every city and town in the Commonwealth has a well organized safety education curriculum administered by a joint school department-police department teaching team, backed up by periodic lectures and demonstrations by the special safety educators of the Massachusetts Registry of Motor Vehicles. With reference to teenage driver education and training, Massachusetts follows the dual system of driver education in local high schools, at local option, or through private or commercial driving schools chartered by and supervised by the Registry of Motor Vehicles -- many of which schools are represented here in this International Conference today.*
>
> *It is my considered opinion that the so-called commercial or public driving schools do a better job, overall, than do the ordinary public and parochial school programs in Massachusetts. For one thing, the Registry of Motor Vehicles exercises complete jurisdiction and supervision over the private schools, whereas, in the public and parochial schools, the Motor Vehicle Department's jurisdiction is shared with the State Department of Education and in Massachusetts our State Department of Education is not staffed to handle this aspect of school curriculum and largely ignores it. The typical professional driver education school is conducted by professionals who have quality training and this results, together with the dynamics of free enterprise and competition, as a primary elements in their motivation and in their achievement. The typical high school master has a rather indifferent attitude toward driver education. Many -- if not most -- regard*

> *it as an unimportant program tacked on to their regular curriculum and, to a degree, using academic hours which could be better utilized in the main academic schedule, as suggested generally by James Conant and Admiral Rickover. Accordingly, the most talented teachers are not assigned to driver education. On the contrary, this function is most often assigned to the least motivated, least gifted teacher on the faculty and is, in many cases, assigned as an additional responsibility to an athletic coach on the faculty.*
>
> *If the driving teacher in the high school does not measure up -- if he is bored, sloppy or indifferent -- the school master is unconcerned since driver education is after all, a fringe subject and, more than this, the teacher assigned to it has life tenure in his position and cannot be removed save for the gravest causes in a process involving almost incredible administrative roadblocks and difficulties.*
>
> *Accordingly, unless the driver education teacher is utterly impossible, and obnoxious to boot, the chances are he will remain there peddling an indifferent brand of driver education for the rest of his career. At $10 per working hour he is quite a luxury for the overburdened taxpayer.*
>
> *How different it is with the professional driving schools who must measure up to strict supervision and to healthy competition within the field! This is where the dynamics of free enterprise really work to the advantage of a program and of the student. It is simply bad business for you to run a sloppy operation or to to tolerate incompetent instructors in your operation.(7)*

Massachusetts has a unique program for the driving schools because the school owners train their own instructors. Once an instructor has been trained and licensed by the state, he is then qualified to teach anyone eligible to receive a driver's license. It has been estimated that the private driving schools in Massachusetts save the taxpayers approximately $3,000,000.00 annually by allowing the public to receive the driver education courses for their teenagers through the private driving schools.

It is unfortunate if this presentation appears to criticize or ridicule the high school program and instructors. However, year after year, the driving school industry is forced to be the recipient of similar ridicule in states where the properly licensed professional instructor is not allowed to teach teenage drivers without a teaching certificate. This type of ridicule and insult has been displayed in all the states which continue to require teaching certificates for instructors even though they are properly licensed by the appropriate state agency to teach driving.

Problems encountered by the driving school industry are probably no different from problems encountered by other businesses who are forced to compete with state and Federal programs. It is not the objective of the driving school industry to continue to insult and criticize others. We are merely fighting for the right to conduct our business under the free enterprise system and we cannot sit idly by and see our businesses bankrupt by foolish laws and regulations within the state. I feel that each of you would take the same stand if your livelihood was in jeopardy and that you would not remain silent while others engaged in a campaign to destroy or eliminate you from your chosen profession. There is no doubt that the high school program within each state and the concept of the high school courses, policies, and procedures comprise the number one problem of the driving school industry. When more States comply with the intent of Congress, many of these problems will be eliminated.

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VIII SEMINAR GROUPING
AND SEMINAR REPORTS
DECEMBER

SEMINAR GROUPING--DECEMBER SYMPOSIUM

*Brody,L.
°Casey,J.
Brewer,G.
Brown,G.B.
Brown,R.
Cafferty,A.
Cook,D.
Eckerman,F.
Johnson,D.
Kinzer,J.
Mathis,G.
Opfer,A.
Schmitz,W.
Tarrants,W.
Ulrich,R.

*Bussis,D.
°Berry,J.
Bristol,G.
Burd,E.
Crowe,J.
Driessen,G.
Dunn,L.
Eland,I.
Hartman,J.
Karnes,D.
Klamm,E.
Scott,J.
Welch,J.

*Chapman,R.
°Nolan,R.
Bishop,R.
Burneson,R.
Chickos,L.
Dunlap,L.
Edwards,D.
Gram,P.
Kenel,F.
Parker,B.
Sell,W.
Svarc,F.
Whitworth,R.

*Conger,J.
°Aaron,J.
Blankenship,N.
Cain,L.
Darland,E.
Farmer,J.
Gawer,C.
Gumm,J.
Imhoff,C.
Jackson,R.
McLarry,J.
Magwire,R.
O'Leary,P.
Scalet,A.
Stewart,G.
Wilk,P.

*Holmes,H.
°Ellis,R.
Anderson,W.
Boright,C.
Heath,E.
Hough,G.
Key,N.
MacDowell,G.
Malone,A.
Noe,J.
Ritzel,D.
Rarogiewicz,T.
Silvernale,L.

*Lybrand,W.
°Waller,P.
Albano,L.
Bertone,T.
Eales,J.
Gagne,R.
Gray,W.
Irick,P.
Marland,S.
Rathjen,N.
Standifer,J.
Wood,H.W.
Yaksich,S.

*McGuire,F.
°Goff,R.
Arend,R.
Boyer,R.
Brenner,R.
Florio,A.
Forbes,T.W.
Gustafson,R.
Kennedy,J.
Marshall,R.
Marshman,D.
Richards,W.
Selby,P.
Todd,W.

*Teal,G.
°Tossell,R.
Bray,D.
Gallien,S.
Gardner,J.
Hahn,C.
Martinez,R.
Mason,R.
Rumsfield,W.
Sundermeier,R.
Wilson,D.

* Seminar Leader
° Seminar Recorder

*Harman,H.
°Gieda,C.
Barker,M.
Bonessi,E.
Fink,L.
Hartzell,W.
Johnson,B.
McAvoy,G.
Plum,R.
Quensel,W.
Shea,J.
Smith,R.
Timberlake,W.
Williamson,E.

SEMINAR LEADER: Leon Brody

RECORDER: Joseph Casey

The members of this seminar respectfully submit that:

1. Insofar as this symposium is concerned, it would have been desirable to limit its coverage to consideration of the four reports on evaluation of driver education and training prepared for the National Highway Safety Bureau. Such limitations would have made possible more two-way communication on the substance of these reports as well as more detailed discussions within the seminar groups. It also would have been helpful to crystalize the over-all objective of this symposium. As it is, uncertainty regarding the latter was rather apparent.

2. If the previous conclusion is supportable, then it is the firm feeling of the seminar participants that it would have helped a great deal to have had all four of the contract reports available in advance. This could have made possible careful consideration of specific points in the reports as well as precluding possible misinterpretations.

3. It follows that suggestions for resolutions of evaluative problems and for implementation of recommendations would have been more easy to formulate. This, of course, includes the possibility of new alternatives being offered.

4. Under the circumstances much of the active discussion that did take place was concerned with the evaluative needs and programs underway independently in the states, communities, and supporting agencies represented by members of this seminar.

5. There was a definite indication that the participants were looking for ideas that they could take home from this symposium and could utilize in their professional activities. This desire was not fully met.

6. It was emphasized in this group that the various reports represented designs for research and that many of the questions asked could be answered only after the research had been carried out.

7. Despite these limitations or difficulties, members of the seminar suggested evaluative alternatives in

priority order as requested by the Institute for Educational Development. We would like to have a synthesis of the alternatives and priorities offered by the various seminar groups.

8. In general, the participants were keenly interested in the entire problem of evaluation of driver education and they look forward to obtaining a copy of the four contract papers.

9. The group appreciates the sharing of information but does not wish to find itself in a position of furnishing implicit or explicit approval of these research reports and proceedings.

SEMINAR LEADER: Dale Bussis

RECORDER: James Berry

One problem in evaluation of driver education appears to be that driver education is being evaluated by the NHSB using one criterion, whereas driver educators view their teachings as having much broader objectives. Driver education is designed to prepare a student for good traffic citizenship and cuts across all of the other highway standard areas. Attempts at isolating it are questionable.

RECOMMENDATIONS

1. While the NHSB is developing criteria and acceptable measurement devices, an immediate step to be considered is that currently in use by the various regional accrediting agencies and other existing recognized evaluation methods. Aspects of the program, such as administration, facilities, and instruction, could receive a more objective and uniform appraisal. This proposed evaluative tool should be based on performance objectives accepted and agreed upon by driver educators.

2. It is the consensus of our group that future research projects on driver education consider specific driver education programs and that better attempts be made at equating the variables.

3. It is further hoped that these research efforts consider evaluating programs of recognized high quality (according to the Evaluative Criteria) rather than with standards that allow for inferior programs plagued by low teacher certification requirements, sub-standard teacher preparation, and inadequate state supervision.

4. The existing guidelines, as recommended by the NEA publication Teacher Preparation and Certification, should be used by NHSB in developing the evaluative tool.

5. Potential funds from DOT should be used in meeting the priority needs within driver education. Also, these funds should be viewed as "seed-money," not as a means to sustain programs.

SEMINAR LEADER: Robert Chapman

RECORDER: Robert Nolan

1. We recognize that driver education which is institutionally bound and aims to develop entry-level proficiency is not the only influence on driver performance. Commensurate attention must be given to:

   a. police traffic supervision
   b. better driver licensing
   c. improving highway engineering
   d. a better traffic court system, etc.

   In many instances, driver educators are at the present time assisting the above-named groups.

2. There needs to be a "built-in" scientific evaluation program predicated upon what driver education really is that will provide data for administrative decisions and program improvement. An example of how this process might be carried on is:

   a. Undertake a sophisticated analysis of traffic-related tasks which almost everyone engages in at one time or another. This analysis would include decisions people make when they are not behind-the-wheel -- decisions (and other factors) however, that influence driving performance, such as, the effects of alcohol, drugs, emotions, fatigue, trip planning, etc.

   b. From this analysis, define instructional objectives in precise behavioral terms, and develop instruments to measure whether these objectives have been attained.

   c. As a result of steps one and two, we would then be in a position to demonstrate the concepts and skills (perceptual skills, as well as motor skills) which students can acquire through a formal driver education experience.

   The preceding process would provide a basis for decisions on how much money should be invested in driver education.

   d. In the meantime, efforts should be undertaken to relate the performance proficiencies which

> can be acquired at the completion of a driver education course to a real-world performance proficiency, which we suppose can only be measured through accidents, near accidents, and violations. This step may require the use of intermediate proficiency criteria. If successful in this venture, then driver education can be evaluated in terms of its effectiveness in the attainment of behaviors which have been validated against real-world behavior.

We have the following qualification: To us, driver education should be evaluated only on its power to influence behavior within a time period of, perhaps, five years -- and, we should emphasize, a critical five years in the career of the young driver. To us, driver education prepares people to "enter" a lifetime of driving and to help avoid the hazards, frustrations, and trial and error that they would experience otherwise, particularly during the early part of their driving career.

To accomplish the preceding evaluation process, we need the resources of the Federal government and the competencies of the scientific community.

SEMINAR LEADER: John Conger

RECORDER: James Aaron

The process of evaluation in all fields is a complex but necessary activity. In the field of driver education it has been recognized for some time that evaluation must be an integral part of program development in order to assess the success in obtaining program goals and/or objectives. Obviously this has been carried on with varying degrees of sophistication.

A number of deterrents to the valid or successful evaluation of driver education programs exist here in the 1960's. It must be recognized that these deterrents need to be taken into consideration if valid results are to be the culmination of any research undertaken. Otherwise findings are unreliable and tend to distort driver education "as it is" in the eyes of the general public and educators alike.

The deterrents (problems) alluded to are many, with the list below including those that seem to be most germane to the subject of evaluation in driver education.

1. The absence of criterion measures to assess properly both short- and long-range goals of driver education. (The State of Washington has a simulator project underway in driver licensing that may lend assistance in this area.)

2. Lack of proper definitions of the driving task where measurable objectives are identified. (The State of Illinois Task Analysis Curriculum project should provide an excellent basis for such definitions.)

3. Absence of adequate time element to accomplish program goals. (30 and 6 requirements has become a stone around the neck of the educator.)

4. Classroom and laboratory instruction being fragmented and not closely integrated.

5. Inadequate teacher qualification that results in varieties of instructional patterns and modes. (Part-time versus full-time teachers and their relative effectiveness.) (Lack of in-service opportunities for teachers.)

6. Absence of a conceptual model for teacher education curricula, which is a prerequisite to good teacher preparation. (Funding and lack of facilities are primary problems in the upgrading of this area.)

7. A lack of knowledge of which driver education program plans are most productive -- dual control, simulation, multiple-car -- in order to establish most appropriate instructional methods.

Additional deterrents or related observations that affect evaluation in driver education are:

1. The need for traffic safety instruction on a K - 12 and adult basis. (Elementary teachers have no preparation in traffic safety education.)

2. The need to improve the entire highway transportation system. (Streets and highways, and other traffic-related programs.)

3. The need for the development of traffic citizenry is a goal for driver education, but is a by-product of other activities.

4. The need for analysis and study of the traffic accident involvement of males versus females.

5. The need for a continued effort to determine causes of traffic accidents in order to determine proper inputs for driver education programs.

6. The need for study and validation of the role and use of paraprofessionals in the instructional process.

7. The need for clarification of the role of simulation systems in the driver education program. (The principal value is in development of the decision-making process and identification of high accident potential locations.)

8. Statement: Accident prevention is a goal of driver education.

The National Highway Safety Bureau should be encouraged to support the 18-semester hour requirement for driver education as currently recommended in the 4.4.4 manual on Driver Education. When the fifth contractor's report is available, the group would be interested in being informed of the results.

SEMINAR CHAIRMAN: Harold J. Holmes

RECORDER: Richard D. Ellis

There is public and professional commitment to driver education in American schools and colleges. It is not a question of whether to offer driver education. The question is what form or forms should the instruction take in order to accomplish its objectives more effectively and efficiently.

1. The researcher, as a theoretician, needs to acquire a substantive background in high school driver education and the professional preparation of high school teachers.

2. Evaluation criteria for determining program effectiveness and program characteristics are lacking at the higher education level.

3. High school driver education, as one component part of the highway safety movement striving toward accomplishment of the ultimate goal of accident reduction, has been attempting to extend its objectives beyond this single goal.

The program should include, as high priority, experiences which are most likely to result in accomplishing terminal behavioral and measurable objectives.

Experiences that are less directly related to the accomplishment of the immediate and long-range objectives should be assigned priority on the basis of their demonstrated relationship to course objectives.

The magnitude of the traffic accident problem necessitates increased efforts to identify and implement processes of integrating or correllating traffic education at all school levels and through college for purposes of reinforcing instruction offered in the high school course for beginning drivers.

4. The NHSB generated research findings in driver education and other areas have not been communicated to the practitioners by the Bureau within a reasonable period of time.

5. Driver education program guidelines and manuals have not been available to administrators and teachers in the field on a timely basis.

6. Some practitioners and school administrators seem to be unaware of the availability and use of existing NEA D-6 Evaluative Criteria for use in self-evaluation of driver education program characteristics.

7. Some investigators have pointed up the inadequacy of current information on driver education programs, yet there does not appear to be an attempt by the researchers to specify for teachers the kinds of material needed for future driver education program evaluation studies.

8. Ongoing in-service education of driver education teachers has not been adequately provided in terms of effective program characteristics.

9. The total implications of the driving task, as related to the teaching of high school driver education, have not been outlined for the teachers of the programs. Once this has been done, the teachers will be in a better position to:

   -Develop a curriculum enbodying the accomplishment of objectives.

   -Develop realistic and attainable objectives.

   -Offer a comprehensive program of classroom and laboratory instruction on a concurrent and integrated basis, following sound education practices.

10. The empirical knowledge gained through years of experience in real-world teaching of high school driver education has not been communicated effectively and efficiently to those conducting research in highway safety related areas.

11. The thoughtful real-world practitioner needs to be involved in the planning, development, and implementation of action research.

Usually the high school teacher is not proficient in the design of experiments, nor does he know the limits of various statistical techniques. A publication should be developed on how to design and conduct relatively simple highway safety research studies which could be utilized by high school teachers.

A graduate level course should be designed to alert teachers of driver education to research methodology applicable to highway safety research. This course could be an elective in the professional in-service education of enrolled graduate students.

12. Broader communication is needed to alert school system decision-makers to the work being done to identify ways by which driver education programs can be evaluated, with a view toward improving program effectiveness.

13. The importance of strengthening driver education programs through improved teacher preparation has been stressed. At this point, what specifics can be recommended to cause teacher preparation institutions and others to achieve this end?

SEMINAR LEADER: William Lybrand

RECORDER: Patrica Waller

Our group began with the perhaps unwarranted assumption that driver education is here to stay, and that we should concern ourselves at this time with what might be done to improve its quality. We took the position that initially it is necessary to specify clearly what are the goals of driver education defined in behavioral outcomes. The goals we delineated are as follows:

° A general ultimate instructional aim of improved traffic citizen effectiveness, with emphasis on improvement of the efficiency of driving as well as a reduction in the mal-performances, including accidents.

° A terminal objective of making wise traffic citizens in the context of today's traffic system as indicated in the performance of driver, pedestrian, and passenger behavior.

° An enabling objective of making effective use of living space and understanding the role and need of traffic laws.

1. Figure 1 attempts to diagram the traffic education program as we would envision it. Samples of driver education students are represented by S_A and S_B. Certain information would be obtained on these students before they begin their driver education. This would include a measure of their traffic knowledge when they come into the class, perhaps a measure of personality, information concerning sex, socioeconomic status, IQ, and motivation. Further information would be obtained concerning the driver education teacher, his methods, and length and kind of course offered. These input measures would be obtained primarily for the purpose of evaluating the subsequent training in light of the input measures. For example, it may well be that boys would respond better to a different kind of driver education program than girls. It could well be that students from different socioeconomic backgrounds might benefit from different kinds of programs, e.g., students from a lower socioeconomic background may have more resentful attitudes toward authority, and it might be worthwhile to investigate somewhat different approaches to such students.

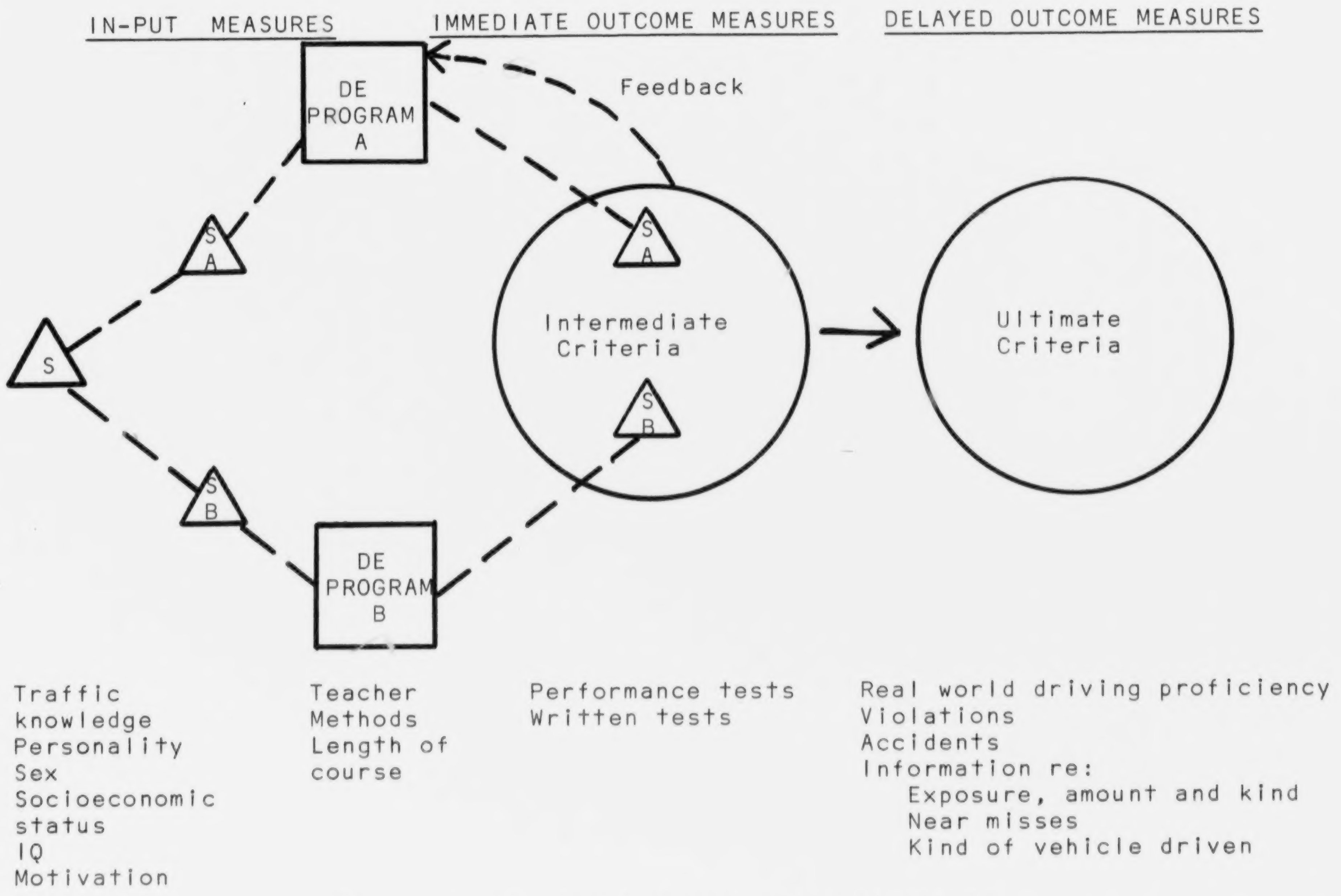
IN-PUT MEASURES
IMMEDIATE OUTCOME MEASURES
DELAYED OUTCOME MEASURES
Feedback
DE PROGRAM A
DE PROGRAM B
S
S A
S B
Intermediate Criteria
Ultimate Criteria
Traffic knowledge
Personality
Sex
Socioeconomic status
IQ
Motivation
Teacher
Methods
Length of course
Performance tests
Written tests
Real world driving proficiency
Violations
Accidents
Information re:
Exposure, amount and kind
Near misses
Kind of vehicle driven

Figure 1. Design for evaluation of driver education programs

After going through driver education programs A and B (and these would be examples of existing programs chosen because they differ in some major respect), the samples of students would be evaluated according to both behind-the-wheel performance tests and written tests. These evaluations would be considered intermediate criteria but could be used as a basis for a feedback into the driver education program, that is, according to the evaluation of the intermediate criteria, changes could be made in the driver education program.

Ultimate criteria would go beyond whether a student knows how to drive and would be concerned further with whether he actually utilizes his skills in his real-world driving. Thus, ultimate criteria would include his subsequent driving record involving violations in accidents. However, this traditional information could be supplemented by information obtained through questionnaires. In this way, it would be possible to determine exposure, including type of exposure, number of trips and kinds of trips. More complete information could be obtained concerning accidents, including kind of accident and who was found to be at fault. Furthermore, information could be obtained concerning near misses (or near hits). Also, it might be valuable to obtain information concerning the kind of vehicle operated.

2. While we feel it is realistic to hold the driver education training responsible primarily for the immediate outcome measures, that is, the intermediate criteria, we consider the ultimate criteria important to measure for purposes of considering new and innovative approaches to the entire problem of driver education.

3. In regard to the role of the National Highway Safety Bureau the seminar group expressed the feeling that money actually dispersed by NHSB is virtually inconsequential relative to the total funds in the highway safety program. The states are more concerned with the standards being set by NHSB, since these standards will affect far larger sums. In this regard the feeling was expressed that the states could use some wise guidance and help from the experts in NHSB in making decisions about their programs. It was felt that NHSB has a responsibility to the state that goes beyond cost-benefits. While the participants did not reject the notion of standards, they did object to an over-emphasis on disbursement of funds when there is not an

adequate validation of the basis on which funds are disbursed. If driver education is criticized (and certainly with validity) because it has not been demonstrated to be worth its costs, then it is only fair that such validation should be equally required in all areas of the highway safety program. The feeling was expressed that this was not the case at present.

4. There was further feeling expressed that there is a need for greater consistency in the position of NHSB. If states are required to act on the basis of guidelines established in Washington, then NHSB has a responsibility to maintain some consistency in its position so that the state officials are not left with a feeling of ambiguity and uncertainty in regard to their own role and responsibility.

   In regard to research, it was felt that if driver education is going to have to compete for funds because it cannot demonstrate its worth (and this is the position expressed by NHSB representatives to the Chicago meeting) then perhaps it would be appropriate for NHSB to provide the funds to do the necessary investigation. It was suggested that perhaps low priority operational areas should be high priority research areas.

5. It was also suggested that research funds should be aimed less toward further definition of the problem and more toward solutions of the problem. Perhaps enough has been done in regard to defining the problem, and the time has come to go beyond this initial step and grapple with solutions.

6. Further, in regard to research, the feeling was expressed that NHSB has not had an open door policy regarding research proposals. Recognizing the importance of research that originates within the framework of the Bureau, nevertheless the seminar group felt that research ideas should originate from many sources and not be confined to the pre-defined notions of the Bureau.

7. It was also pointed out that the law at present says that every state will have a research program in driver education. It was felt that this may not be the most efficient approach. While some states can handle such a requirement, others will be hardput to meet this demand. Why not have research coordinated at a Federal level and have certain kinds of research done in some states which could then provide the

necessary information to all states?

8. Feeling was also expressed concerning the stated goal of NHSB, namely the goal of accident reduction. In this regard it was felt that this goal must be further defined in terms of the price that is to be paid. For example, there is reason to believe that accidents could be reduced by much more stringent licensing. We could refuse licenses past the age of 65 or even age 50, and probably succeed in lowering accidents; or, we could license only the top 40 percent of driver license applicants. Are we willing to pay so high a price, or do we want to temper our stated goal of accident reduction? There is some evidence that suggests the risk-taking exemplified in some traffic accidents (certainly not all) may be an expression of a more basic personality characteristic that has been found to be associated with creative production. In other words, some of the personality characteristics that may result at times in accidents on the highways may be the same personality characteristic that lead men to undertake other risks such as going to the moon or pioneering in an area where one's scientific reputation may be at stake. It may be that to become a nation of "safety nuts" that no longer have accidents on the highways, will require a price that will guarantee the end of progress in other areas. Just what price are we willing to pay?

SEMINAR LEADER: Fredrick McGuire

RECORDER: Robert Goff

Because of interest expressed by the group, Dr. McGuire described his recent research report, "An Experimental Evaluation of Driver Education" (winner of 1968 Metropolitan Life Award). He also described how the press reports were at variance with the actual report.

Of the many areas discussed in the seminar, several points are summarized below:

1. The four major reports were a source of misunderstanding. It was strongly felt that copies of the reports should have been distributed to the participants prior to the convening of the symposium.

   It was felt that the research reports would have been more valuable if the contractors had not been so pressured for time. Some of the reports reflected this time pressure. For example, the content of the reports did not seem to reflect wide differences among the various states. A nationwide shortage of driver education teachers was implied in one report, yet several states (e.g., Wisconsin and Michigan) have a surplus of certified driver education teachers at current certification levels. Apparently, there is no such thing as a clear-cut teacher shortage.

   Also, many of these studies were mistakenly billed as "research," when in fact they are merely "search" or feasibility studies.

2. It was felt by many driver education teachers that this effort to establish evaluative techniques did not reflect a close liaison with the practitioners of driver education. This effort had the flavor of a newcomer to the field coming in from the outside and ignoring the two decades of effort on the part of the practitioner. Specifically, driver educators have striven toward achieving the goals set forth in "Policies and Practices for Driver and Traffic Safety Education," while these outside researchers and their reports have focused on traffic accident reduction. Traffic citizenship (the Big E) was accepted unanimously as a goal, a very key goal, of

driver education. However, divergence of opinion existed as to the proper emphasis, if any, to be placed on accident prevention as a major goal of driver education. This divergence of focus tended to create an undercurrent of discontent, even resentment, throughout the meeting. This confusion must be resolved among driver educators, government officials, researchers, and public support groups. Perhaps there should be two courses, one in driver education and one in accident avoidance; or should there be one comprehensive course? There was strong feeling that driver education is merely the 10th grade manifestation of a comprehensive kindergarten through 12th grade (K-12) safety and traffic safety education program. Not everyone accepts the accident reduction criterion as the major emphasis in driver education.

3. Because the National Highway Safety Bureau is bound by the criterion of death and injury reduction, it cannot be expected to relate to all aspects of driver education. Support should continue to come from Public Law 89-10, the National Defense Education Act, and the Department of Health, Education and Welfare. Increased leadership should be generated from HEW. Driver education is interdisciplinary--and interdepartmental.

   In spite of its potentially limited relationship to the field of driver education, the setting of priorities by NHSB has generated much confusion and has hurt many state driver education programs. NHSB should define its role in this field very soon, and in such a way as not to damage those elements it may not choose to support.

4. The problem of communications and public relations must be faced realistically and in a positive manner by driver educators. Our people must learn the basic principles of public relations and conduct themselves accordingly during media interviews. We should prepare press releases and take the initiative in public relations. We must consider developing public relations channels independent of the media. We cannot afford to permit the fate of driver education to be settled in the press, as is happening at the present time.

5. Driver and traffic safety education is interdisciplinary and contains a strong behavioral science emphasis, a fact not yet recognized by most colleges and uni-

versities. Many schools and faculties still deny the interdisciplinary nature and academic qualifications of traffic safety education. As a consequence, teacher preparation and research have lagged behind the need, to the point where quality teacher preparation is a most critical element in driver education today. Teacher preparation for traffic safety education should not have less emphasis than a traditional subject area. It should be recognized as a separate and equal subject area and instruction should be given by full-time staff members adequately trained in and dedicated to this specialty.

6. Most state reimbursement laws make no financial provisions for teacher preparation or research in traffic safety. Some state reimbursement laws preclude use of funds for these purposes. There is a feeling of need for substantial funding of programs at the college and university level. Scholarships and fellowships of sufficient size and quantity, in competition with the financial inducements offered by the scientific and technological disciplines, would permit quality undergraduate and graduate students to choose traffic safety education as a career.

7. College and university professors of traffic safety education have produced a few research findings to date. Most university research on driver and traffic safety education have come from such allied disciplines as engineering, psychology, and preventive medicine, not from driver educators. There is an urgent need to develop a substantial number and support for driver educators capable of conducting quality research studies.

8. There is a need to develop additional regional safety centers in connection with strategically located colleges and universities throughout the United States. These centers should include training for all traffic specialties (as outlined in the Booz, Allen and Hamilton report), through credit courses, conferences and short courses, field services, information and materials services, and research.

In summary, while seminar members vigorously expressed divergent opinions on many of the above points, they felt that there was genuine value in the exchange of opinions that transpired. In fact, this "mix" of participants seemed unique and should occur more often as a means of preventing the field of driver education from becoming too parochial.

SEMINAR LEADER: Gilbert Teal

RECORDER: Richard Tossell

This group started out by talking about the purpose of evaluation. We came to an agreement that it was a management improvement and progress tool rather than a form of rating, that those being evaluated must understand and accept the criterion upon which they are being evaluated.

We spent an inordinate amount of time attempting to define the objectives of the conference. In our first attempt at it, we concluded that we were to give assistance to the National Highway Safety Bureau with regard to the new national highway safety standards, particularly 4.4.4 in driver education. Our later evaluation seemed to center around the fact that we were in the process of self-evaluation on the basis of a new set of ground rules being laid down by the National Highway Safety Bureau.

Relative to the problems of evaluation, we did seem to agree, at least at this session, that we were not shooting for zero defects, but rather to improve the "state of the art". Some of our observations and recommendations follow.

1. Our problems were more societal than strictly educational.

2. A block to progress and integration seems to lie in the decisions as to whether driver education is the domain of the Office of Education or the National Highway Safety Bureau. Now if the main objective of driver education is education rather than accident prevention or the saving of lives, then why should DOT have responsibility for it?

3. We concluded that the real objectives of driver education, however, have never clearly been defined. I think this is an important point. If we are going to proceed anywhere I think we're going to have to actually start with a clear set of objectives.

4. If driver education is concerned with accident prevention and not injury reduction, then another block to progress is the lag between the need for up-to-date information for the field, and the lack of such current information and utilization of advanced teaching methods and technology. Student preparation should include, therefore, new integrations of educational

techniques and methodology and we should not leave out such things as learning centers for the community and greater use of the family in the educational process or training process.

5. We also came up with a recommendation that a way should be found to keep the grass-root teachers of driver education informed about changes in priorities in the various bureaus. The National Highway Safety Bureau can be of great value in accomplishing this. We feel that another follow-up symposium should be conducted under under the auspices of ADTSEA of NEA to update the policies and practices of driver education teachers. Perhaps this proposed symposium could include administrative leaders in education, other than driver educators or supervisors of driver education. This would generate the interchange of information and ideas.

6. We feel standards should be established for a teaching minor in driver education, and that the gap between teacher certification requirements and the teaching minor should be reduced as rapidly as possible.

7. We have dual standards for high school driver education and commercial driving schools and we feel that this complicates needlessly the evaluation process and, therefore, there should be a single standard for teacher preparation.

8. We feel that evaluative criteria can and should be constructed for the purposes of evaluating the processes involved in driver education and not necessarily be restricted to the end goal of reducing injury and death.

9. And, lastly, driver education is not a microcosm separated from the rest of the world. We need to relate to the big picture of problems facing drivers and others involved in traffic movement problems such as, all types of trailers, pedestrians, bicycles, motorcycle drivers, etc. In other words we need comprehensive safety education for all schools and all students of which driver education is but a part.

SEMINAR LEADER: Harry Harman

RECORDER: Cissie Gieda

The reduction of traffic accidents, injuries, and fatalities has been stated by the National Highway Safety Bureau to be the over-all goal of the traffic safety program. With this statement in mind, our seminar group would like to make the following observations and recommendations.

1. We believe the ultimate goal can be achieved only by the combined efforts of the specific programs. Therefore, intermediate goals must be established for each specific traffic safety program. It then follows that each specific program needs to be evaluated on the basis of the intermediate goals rather than the ultimate goal. This generates the following questions:

    A. Are there highway transportation system goals that take priority over intermediate goals?

    B. What are the intermediate goals that must be achieved before the ultimate goal can be achieved?

    C. Can we truly evaluate whether or not any specific program is achieving the ultimate goal, or what proportion of the achievement is due to the specific program?

    D. Is there a multiplicity of factors involved in an accident and injury causation which of necessity demands a balanced approach?

    E. Must the various programs compete with each other rather than supplement and/or complement each other?

    F. Does any one program have real identifiable pay off, or is the pay off found in combinations of programs?

    G. What is the role of education (public, formal, and informal) in each of the program areas, and what aspects of this education can be included in a driver and traffic education program at the secondary level? What can be included at the elementary level?

2. The driving task in an ever-changing motoring society must be analyzed, defined, and redefined. Objectives of driver education can then be developed from the task. These objectives can be used in the development and improvement of the curriculum. Driver education should be geared to the driving task. Evaluation can proceed with objective behavioral responses of the driving task as the basis for evaluation.

3. We welcome and need researchers, although caution must be urged. We resent the public taking as gospel a part of a report, especially if taken out of context. Researchers, we ask caution when entering the real world. It should be, and must be, your responsibility to write in a language that can be understood by all. Please avoid vague generalities. The driver education community must get to know from the research community.

4. In addition, we would like the researchers to identify where the best driver education programs can be found.

5. Each safety program must be a total set. A solution to this task will be reached only with a total program.

6. This group believes that the curriculum for driver education should be within the province of the United States Department of Health, Education and Welfare. We do not believe that course content is a factor for the direct concern of the National Highway Safety Bureau.

IX SEMINAR GROUPING

AND SEMINAR REPORTS

JANUARY

SEMINAR GROUPING--JANUARY SYMPOSIUM

*Rhodes,W.
°Cheney,T.
Anderson,M.
Frick,R.
Gantner,D.
Hillenburg,A.
Hreha,E.
Hull,L.
Jackson,R.
Lesser,E.
Parker,D.
Right,M.
Teal,G.
Wahl,F.
Yarish,S.

*Kerrick,J.
°Halula,P.
Atkins,S.
Dunnigan,F.
Gruner,G.
Janowski,D.
Koch,M.
Laybourn,C.
Lybrand,W.
McGinley,J.
Million,L.
Parker,J.

*Strasser,M.
°Naumann,H.
Baldwin,J.
Edgerton,R.
Harman,H.
Job,C.
Mathis,G.
Monday,P.
Perkins,C.
Reid,J.
Welch,J.
Whitworth,R.
Wollenburg,A.
Young,J.

*Platt,F.
°Marshman,D.
Albrecht,G.
Bass,M.
Behnke,A.
Buffone,C.
Dollinger,M.
Gromacki,K.
Hodge,B.
King,H.
Matthias,H.
Oakland,T.
Smith,L.
Wilk,P.

*Rumsfield,W.
°Gammill,U.
Bero,J.
Brenner,R.
Comer,T.
Ellis,F.
Foreman,C.
Holsinger,E.
Kaminski,D.
Klamm,E.
Klein,P.
Lola,E.
Luty,J.
Millard,J.
Raymond,L.
Stern,R.
Tarrants,W.

*Rarogiewicz,T.
°Barker,M.
Bogue,B.
Breland,L.
Chapman,R.
Covert,W.
Dunn,L.
Fitzgerald,T.
Gard,M.
Hodge,H.
Hungness,M.
Reedy,J.
Russo,T.
Russo,A.
Smith,H.
Thorstens,R.
Tracy,M.D.
Wynia,J.

*Vinson,H.B.
°Hensel,G.
Barkalow,G.
Bruggeman,D.
Conger,J.
Finch,A.
Heath,E.
Kennedy,J.
LaPietra,W.
Memmler,L.
Regan,R.
Toth,S.
Woods,W.

*Hill,P.
°Woods,J.
Anderson,M.
Brody,L.
Campagna,T.
Casey,J.
Cook,H.
Dootson,R.
Gagne,R.
Hassett,J.
Janzaruk,J.
Murphy,R.
O'Day,C.
Timney,R.
Wilson,J.
Yaksich,S.

* Seminar Leader
° Seminar Recorder

SEMINAR LEADER: William Rhodes

RECORDER: Thomas Cheney

Our seminar group submits herewith seven recommendations relative to the effective use of recent research findings and practices as reported to this symposium on the "state of the art" in driver education and driver training.

1. We recommend that there be a "multiple-standard-concept" in driver education and training programs as it relates to instructor qualifications and details of the course of study. However, we believe that all driver education and training programs should have the single goal of performance proficiency on the part of the end product, that is, the graduate of the driver education course.

2. We recommend that the National Highway Safety Bureau proceed with the development of an evaluation procedure which will adequately measure driving proficiency essential to the real-world traffic demands We further recommend that the commercial driving school industry unite in and cooperate with the validation process which necessarily will be involved in the development of such an evaluation procedure.

3. We recommend that research agencies utilize the information and resources of the professional organizations of the commercial driving school industry in developing programs which will produce safe drivers.

4. We recommend that each individual, regardless of age, should, prior to licensing, receive formal driver education and/or driver training which meets the standards set by the National Highway Safety Bureau to meet performance criteria of real-world traffic situations and experiences.

5. We recommend that commercial driving school instructors who are properly licensed by the appropriate state licensing agency shall be considered qualified to teach anyone eligible to receive a driver's license, and that such instructors need not have a college degree, provided the following standards of the National Professional Driver Education Association are met by the employing driving school:

    a. Recommended NPDEA Course Content for Education and Training Program For

Professional Driving Instructors, which includes the concept of the Harold Smith System.

   b. Recommended NPDEA Standards For Behind-the-Wheel Training.

   c. Recommended NPDEA Driving School Laws.

   d. NPDEA Code of Ethics.

6. We recommend that the offices of the National Highway Safety Bureau be utilized to effect a meeting of the leaders of the commercial driving school industry and the leaders of the public school driver education community in order to establish the areas of agreement and disagreement and in order to combine and apply to the critical problems of highway safety the strengths and forces of these two major segments of the driver education field.

7. We recommend the promotion and development of simple and inexpensive teaching aids for driver education and we further recommend consideration of the establishment of a center responsible for the dissemination of knowledge and information as to the availability of such teaching aids.

8. We suggest the development of a statement of objectives for driver education and training programs, as indicated by the NPDEA Minimum Standards.

9. We encourage all practitioners in this field to avail themselves of the forthcoming Federal Manual on Driver Education and Training. We feel the driving school industry should strive immediately to implement the Federal standards recommended.

SEMINAR LEADER: John Kerrick

RECORDER: Paul Halula

The seminar group agreed with nearly all of the results of the four research studies conducted, and with the recommendation that a single set of performance criteria be established. However, multiple standards are necessary in the various areas of the driver education and training field in course content and instructor qualifications. It is unrealistic to require conformity of education and background for all instructors because of the totally different areas of training and many different needs of the public in these areas. Some basic areas defined were training of teenagers, adults, handicapped persons, military personnel, retraining of licensed drivers, and advanced training such as skid control and commercial driving (buses and trucks). Seldom, if ever, will any sample of a population develop the same proficiency in the same amount of time in psychomotor skills. Therefore, both the high schools and commercial schools are needed in the driver education and training field.

Our group made the following recommendations to improve the driver education and training industry and to reduce traffic accidents:

1. A mixed symposium of public high school driver education teachers, commercial driver training school owners and instructors and other interested agencies should be held to agree upon problems and solutions in this field and to achieve more cooperative relationships. All three groups have much to contribute, and more harmony is badly needed.

2. Courses should be established throughout the nation geared to the needs of the commercial schools.

3. A greater number of periodic checks of driver performance should be established with special emphasis on emergency procedures.

4. Advanced driving courses in emergency procedures should be established in commercial schools.

5. A series of short-range studies could be very effective in developing better driver education and training, and these studies are needed now.

6. The development of better motorcycle testing and schools to instruct in motorcycle operation should be encouraged.

7. Laws governing the licensing of driving schools in all states should be more uniform and more stringent. States with regulatory legislation have always developed a better and more stable industry.

8. Commercial driving schools instructors, properly licensed by an appropriate state agency, are qualified and able to teach anyone eligible to receive a driver's license. Restrictive legislation in some states not allowing them to qualify teenagers for licenses is unrealistic. We do not feel that a college degree is necessary in order to teach a person to drive.

9. Successful models for public and private cooperation, such as those utilized in the state of Ohio and the Province of Ontario, should be implemented on a wider scale.

Our seminar group discussed the following additional topics:

1. Courses conducted by Dr. Leon Brody of New York University and the need for similar approaches throughout the nation.

2. Unrealistic thinking on the part of the association of high school driver education teachers in attempting all adult driver training. Because of administrative difficulties, they cannot meet the needs of students.

All were in agreement that this symposium is a major breakthrough in the driver education and training field.

SEMINAR LEADER: Marland Strasser

RECORDER: Heinz Naumann

1. The participants of this seminar group wish to commend the National Highway Safety Bureau for its outstanding efforts in the field of traffic safety in the short period of its existence. We would encourage and recommend that the National Highway Safety Bureau continue its efforts in research to evaluate and improve the effectiveness of all traffic safety programs.

2. We further recommend that the National Highway Safety Bureau conduct future symposia in a reasonable period of time that will bring together representatives of the commercial driving school industry and the public and private school programs and other appropriate interested parties for the purpose of improving the "state of the art". Such conferences are needed now to provide guidance to all areas of the driver education and driver training field. As research goes forward, results will become available which should help all persons involved.

3. The task of driving under present real-world conditions is a complex undertaking. The 1949 concept of driver education courses (30 + 6) appears to be inadequate with the tremendous increase of high speed and complex traffic flow. We, therefore, recommend that more research be initiated to determine the number of hours of behind-the-wheel training necessary to develop safe driving skill habits.

   Course content should be reviewed by a commission composed of all segments of those involved in traffic safety, and a new set of minimum standards developed.

   This seminar group, after listening intently to the reports on evaluation of driver training, recommends that the Bureau proceed immediately with the task analysis of driving as the first step in the desired scientific attack on the evaluation problem.

4. We feel that a single research effort may need to be reported or announced by more than one document in order to reach, in an understandable form, all who should know about it. Some of these documents may be:

   A. The complete research report. This includes project design, instrumentation, data, analysis, conclusions, and recommendations. This form is often required to tell the full story for other researchers and doubters and to fill contract requirements of the sponsors.

B. A shorter version of #1 above for journal publication and to fill the needs of most serious workers.

C. An informative abstract to accompany #1 and #2 above. This is also used in clearinghouse publications and for storage in electronic information systems.

D. A press release. This item, prepared jointly by the author and a sympathetic and understanding public information officer, can aid in avoiding misunderstanding and misquotation.

E. An interpretation of the research results directed toward specific changes in policies, manuals, and specifications. This document should be written in the language of the decision-maker rather than the researcher. Supporting information should be brief with fuller treatment carried by reference.

5. Motivation was generally conceded to be very important for good driver performance. Finding that key motivation is the problem.

The various aspects of the total traffic safety movement should not be in competition with one another. There is room for all and plenty of work for all to do.

Our group agrees enthusiastically with the hope expressed that this symposium would be the beginning of our working together with other elements in the traffic safety field, such as driver licensing agencies and the public high school driver education segment.

SEMINAR LEADER: Fletcher Platt

RECORDER: Dewayne Marshman

1. It is strongly recommended that the Department of Transportation exercise all possible haste in incorporating the findings of the five research studies into a finalized program of evaluation. We urge the implementation of the chosen program as soon as possible.

2. It is also recommended that a "clearinghouse" be established for translating research into practicality for all driver training instructors.

A thorough examination and study of current "course content" should be made, extracting the content needed in the real-world driving of today, disregarding topics no longer deemed essential, and emphasizing areas that have become more important to today's driving. We should strive to reach a specific level of proficiency and redesign the term of the course to meet this need. The decay rate of the present course may be decreased by a new approach designed to stimulate student interest. We should investigate the results made by private industry (e.g., Greyhound Bus Company, United Parcel, commercial driving schools, Bell Telephone Company) in reducing accidents and violations. Their types of programs must produce favorable results, or they would be discarded quickly.

3. Laws governing commercial driving schools should be standardized, as recommended by NPDEA. Present laws allow too much variance from state to state.

4. We should have standardization of the certification of commercial driving instructors, as recommended by NPDEA.

5. There should be compulsory driver training for all beginning or entrance-level drivers. The amount of training should be determined by the level of proficiency desired.

6. We should begin an upgrading and sophisticating of driver license testing procedures to insure that the new drivers are capable of coping with real-world traffic situations.

7. We should strive for compatible standards between instructor, tester, and traffic enforcer. These areas are too closely related to remain entirely separate, ignoring common problems.

8. There should be more effective communication between commercial driving schools and public school driver education personnel. Both are working toward the same goal: safer drivers and a corresponding reduction in fatalities, accidents, and violations.

9. There should be a program of periodic retesting of licensed drivers to determine the possible need for retraining.

10. If funds are available for the improvement of driver training instructors, they should be distributed on a non-discriminatory basis for the use of both the public and private driving industries.

SEMINAR LEADER: Warren Rumsfield

RECORDER: U. Hale Gammill

1. The value of adapting methods such as those in use for pilot screening, training, and licensing to our driving school instruction and preparation was discussed.

   It was agreed that further analysis of teaching methods used in preparing pilots might also prove valuable in training driver education teachers.

2. Some studies indicate that at any age drivers are perhaps poorer when first beginning to drive. Accumulating experience at any age produces more skill and makes for a better driving record. Other studies indicate that impulsiveness, feelings of indifference, and resentment of authority are contributing causes to teenagers having collisions. It was pointed out that a Stanford research study indicates that the number one safety move to cut down collisions among young people is to let them mature a little longer before learning to drive. It was suggested that young people would be safer if they were at least eighteen years of age before driving.

   Although there are exceptions concerning sixteen year olds being mature enough to drive safely, it was unanimously agreed that waiting until a child is at least eighteen years old might certainly be better, from a highway safety point of view.

3. Tests to measure attitudes were discussed, as well as the theory that a few days of intensive indoctrination of drivers might possibly change attitudes.

   It was suggested that The National Professional Driver Education Association research chairman study the feasibility of some of our member schools assisting with the refinement and field testing of attitude measuring instruments.

4. One school owner mentioned that the Harold Smith System solved his school's problem of molding reckless teen boys into safer drivers. The hazard of their wanting to speed was neutralized by the superior use of their eyes in conjunction with always having adequate space cushioning.

5. "Should classroom teachers have instruction in behind-the-wheel training?" was an important question for this group. Various examples were given where public school and private school classroom driver education teachers had never taught behind-the-wheel driving. The group concluded that classroom teachers should have a valid driver's license with a good driving record, and should be experienced in behind-the-wheel instruction.

6. Another question raised was: "Would the quality of our instruction be better if our teachers were certified college graduates?" Several driving school owners, who hired high school driver education teachers part-time and during the summer for behind-the-wheel training, told of the enthusiasm expressed by these teachers for the methods used by private driving schools. One high school driver education teacher was so impressed with what he learned from a professional school that he arranged a workshop for his colleagues. The driver education teachers from the district's several schools were taught in the classroom and on the road by a staff from the professional driving school. The group concluded that at present the best of professional driver training schools are better able to train their own behind-the-wheel instructors than are colleges or universities.

7. One member of the group stated that there should be a "single performance standard," but in his opinion there must also be "multiple types of programs and multiple teacher qualifications."

   This statement was enthusiastically and unanimously endorsed by our seminar.

8. The following question was raised: "What would be your reaction to the Department of Transportation financing training of your instructors in a junior college program, with your association developing the curriculum and furnishing the teachers for the course?" The probability that this plan would eventually result in a two-year teacher training program at no cost to the driving school was discussed.

   This plan could probably be sold to the profession if the instruction was not a prerequisite to hiring and did not delay putting the driver training teacher to work.

9. In Canada, professional driving instructors and high

school teachers who wish to be trained as driver education specialists are trained by safety councils with the assistance of commercial driving instructors and university-level course directors. Also in Canada, departments of education authorize school boards to contract with commercial driving schools to perform the in-car instruction.

This practice results in professional driving schools doing most of the behind-the-wheel training, while the public schools teach most of the classroom phase of driver education.

10. It was suggested that in the United States high schools should teach only the classroom phase of driver education, and professional driving schools should teach only behind-the-wheel training for teenagers.

There was unanimous and wholehearted agreement that this plan might bring about permanent "peace" to the driver education field.

SEMINAR LEADER: Thad Rarogiewicz

RECORDER: Miles Barker

Our group discussed many ideas concerning professional driving schools and gave much thought to the problems involved in attempting to evaluate their training programs.

1. We feel that we must look for better methods of evaluation for driver training programs. One of the problems of evaluation is defining the driving task and then evaluating its effectiveness. A corollary would then be evaluating the driving school program. The driving task should be identified and procedures or measures be devised to measure the tasks and the proficiency of driving performance. Control states might be used where professional school teenage student's driving records would be compared with those of the public high school driver training students and with those receiving no training at all. At this time, good evaluative criteria have not been developed and, therefore, a finished product won't be produced. Problems of obtaining information concerning driving schools and the driving records of their graduates were discussed, such as the small percentage of returns received by the National Highway Safety Bureau on its questionnaire mailed to the various state Motor Vehicle Departments. The same problem would occur in mailing questionnaires to former students.

2. Our group delved into many other problems of driver training besides those concerned with evaluation. The question of how far to go in research was raised. Where does it end, and where do the results of its findings, culminating in an action program, start?

3. Multiple standards were discussed regarding both the type and kind of training for instructors and the length of both the classroom and the behind-the-wheel phase of the program as compared to that of the public high school instructors and the high school programs. The majority felt that the best instructor training for the behind-the-wheel phase could be done in the car, whereas the classroom phase could be done before the instructor was hired. It was felt that in this way, the effectiveness of the instructor training would be much greater than teacher certification where most of the training takes place in the classroom.

4. We commented on the opinion that ninety percent of good driving is due to correct seeing habits, which revolve around the space cushion method of driving. However, until licensing standards are upgraded, (and more stringent standards must be adopted at the insistance of the Federal government) it will be difficult to upgrade training standards.

5. We raised the question regarding the correlation between the road-test examination grade and the subsequent accident-experience ratio. As of now, there is no evidence to prove what a poor or a good road-test grade means. (Also, the variance in the difficulty of the road-test would have to be considered). Caution was expressed in comparing various types of students of commercial schools to teenagers of public high schools. For example, can the effectiveness of the number of hours of training a fifty-year-old widow be compared to the effectiveness of those hours required to train an average high school teenager? It must be recognized that many of our students come to us after finding themselves incapable of learning from friends, relatives, public or adult school courses.

6. The interesting idea was expressed that the teenage driving problem could be due to early learning processes and not to youth.

7. The definition of education was bandied about and it was generally accepted that it was any learning experience, anywhere.

SEMINAR LEADER: H. B. Vinson

RECORDER: George Hensel

Below are the summary statements of various problems discussed by our seminar group and the proposed solutions to these problems.

1. Lack of communication between various safety groups, primarily the professional driving schools of America and the various high school educators. This lack of communication manifests itself in the two groups pulling diametrically on various problems, a general distrust of the other's motives, and unwillingness to try to resolve the problems together. The end result is that either group's casting doubts about the other group's abilities tends to reflect upon the original group. "If you punch holes in the front of the 'driver training boat,' then just as surely as the front end sinks, so shall the back."

   Our seminar group felt that a committee could be formed with representatives of each of the major groups involved in the safety program, such as representatives from the commercial schools, the high school group, safety council, auto manufacturers, insurance group, etc. This new group could meet periodically and discuss the common problems and possible solutions. There would be a better "inter-communication" among various organizations working together in those areas where possible rather than opposing each other.

2. It was felt that there was not a proper criterion by which to measure the end results of professional driving schools. How can you properly evaluate a school? Is it by number of students passing the driving test, or the "quality" of the student trained (that is, how much he was taught, etc.)? It was felt that until a criterion is developed, the schools and various other agencies, such as the Department of Motor Vehicles, are "working in the dark" in regard to professional driving schools.

   This is a tough problem, but one that should be resolved. It was proposed that a study group be formed to ascertain if it would be possible to develop a set of standards which would be used to evaluate professional driving schools. It was realized that the National Professional Driver Education Association has developed such a set of standards, and one of the research firms has proposed a tentative set of standards. It was suggested that these two proposed sets of standards be used as a base from which to proceed.

3. The current high school standard of "30 and 6"-- that is, 30 hours of classroom and 6 hours of behind-the-wheel training is a problem because the general public is not aware that a student cannot be taught in 6 hours of behind-the-wheel training. Parents are led to believe that their child has been "taught to completion." The problem is further compounded when a professional driving school tries to give the student 15 or 20 hours of such training, as recommended by the National Professional Driver Education Association. The public feels the lessons are being prolonged.

   This symposium should go on record as strongly advocating abandonment of the so-called "6 hours of behind-the-wheel training." A more realistic figure of of 10, 12, 15, or 20 hours should be set. It was further realized that all national leading authorities in the field of driver education-driver training indicate that 15 or more hours should be recommended. Japan has a minimum of 22 hours behind the wheel. Germany, Sweden, and England also indicate much higher hours, and the National Professional Driver Education Association is on record as advocating at least 15 hours of behind-the-wheel training.

   It was strongly felt that the high schools would have a much better record for themselves in teaching half the number of students they are currently instructing with 12 hours per student, than with the current 6 hours. At least those drivers would be better trained and more capable of taking their rightful place on the highways of America.

4. The Department of Motor Vehicles tests throughout the nation are far too easy. We realize that there is in many states a budgetary and manpower problem; however, in practically all cases the state test is a farce. It is a wonder that the annual mortality rate on the highways is not much higher than it is. It was strongly felt that the state examiner is in a key position to prevent incompetents from becoming part of our motoring public.

   We strongly advocate that the various state driving tests become much more stringent. It was pointed out that in some states the test is completed in 4 or 5 minutes. The time element to conduct a test properly should be much more realistic, and the charge should be passed on to the recipient of the test. If this necessitates doubling or tripling the cost of obtaining a driver's license, it would still be a bargain in today's society.

5. There seems to be a general lack of agreement on how long it takes to train a person to drive a car properly, what the public has a right to expect in terms of number of hours of training in a high school or commercial driving school course, what yardsticks should be applied, what items should be covered, how much time should be spent on these items and, in what sequence should they be given. It was realized that it may take many months to become a proficient driver, and yet a certain standard or skill level should be obtained before the student is licensed to drive on his own.

With all the money being spent by the Federal government on possible solutions to safety, it was felt that it would be a worthwhile project to undertake a survey to answer the question, "How long does it really take to learn to drive?" This survey would encompass high school driver training programs, professional driving school programs, various Departments of Motor Vehicles, and the more progressive foreign countries, such as Sweden, England, Germany, etc. From all this information we should be able to reach some basic conclusions on the question.

It was felt by our study group that there should be more symposia of this type for the purpose of disseminating information and seeking possible solutions to some of the more outstanding problems. Our seminar group wants to go on record as strongly advocating that this be developed in the very near future.

SEMINAR LEADER: Paul Hill

RECORDER: John Woods

Despite the absence of conclusive statistical evidence to prove our position, we, as professional driver trainers, maintain a strong conviction that the fully trained driver is the best available answer to improved road safety and accident prevention.

1. We believe that statistical evidence to support this stance will develop as an improved data base develops and research continues, and we enthusiastically support further research and development by private and public agencies in this area.

2. We also believe that the present and future need for really effective driver training is of such magnitude that neither the professional nor the secondary school driver training systems can possibly assume sole responsibility for the total student load. Indeed, there is every reason to think that the volume of students will be so great that there will be a serious shortage of trained personnel in both systems. Therefore, the question becomes not one of competition between two systems, but how this demand can be most effectively managed, with primary emphasis on measurable results, on measurable improvements in driver performance. Cooperation and interchange of ideas between the two systems is imperative.

3. We urge that all persons and organizations interested in driver education and training "close the circle" in a working relationship among the professional and secondary school driver training systems and other state and Federal government and non-government organizations interested in driver education and training.

4. We encourage the development of both "short-range" and "long-range" research systems and workable plans to develop and meet higher standards for courses in driver training and education for the personnel entering this field.

5. The professional driving schools would welcome suggestions in the area of improved teaching techniques and methods from any source for practical evaluation. Since NPDEA is now the source of many useful instructional and evaluative materials, we urge the widest possible dissemination of these materials. We urge

also that further research in the area of evaluation be made at the earliest possible date in the specific areas of classroom instruction, simulator use, and the behind-the-wheel phase of driver training and education.

7. We recommend that every attempt be made to tailor instruction to meet the particular individual student's needs. There is an urgent need for both the professional and secondary school system to be released from the archaic and inflexible imprisonment of the now obsolete single standard 30 + 6 theory. This is necessary to permit the flexibility required to develop multiple training standards and to make possible the evaluation of the practical effectiveness of the new techniques and time standards.

8. Since present driver testing procedures are woefully inadequate, we suggest more rigid testing. This would force improvement in training and educational techniques. It is a step which probably could be accomplished very soon by state highway licensing agencies using their present authority under existing state legislation. Therefore, we feel this improvement is deserving of immediate attention from all levels of governmental safety units as a first priority.

X JANUARY PANELS

THE HIGHWAY SYSTEMS RESEARCH CAR

Fletcher N. Platt, Manager
Traffic Safety and Highway Improvement Dept.
Ford Motor Company

Mr. Platt is Manager of Ford Motor Company's Traffic Safety and Highway Improvement Department. He joined the company in 1950 in the Ford Division Truck Sales Department. He soon was promoted to the marketing staff and later served as a product planning assistant in the executive office.

Before joining Ford, he held executive engineering positions with Rheem Manufacturing Company, Kaiser-Fleetwings Company, and Chance-Vought Aircraft, Inc.

Mr. Platt earned a Bachelor of Science degree in aeronautical engineering from the University of Michigan in 1938. He is a licensed pilot.

An inventor, Mr. Platt recently designed and developed the Ford Sentinel, an experimental driver aid which warns the driver if he becomes erratic in his driving. He is credited with the development of the time-lapse driver education filmstrip series produced by Ford and used widely throughout the United States. He has authored papers on highway systems, driver behavior, and traffic characteristics. He is a proponent of the automobile seat belt, advocating its safety value and usage as early as 1953. He also has gained first-hand knowledge of foreign transportation problems through his European travels.

Mr. Platt is a Director of the Traffic Safety Association of Detroit and a member of the Board of Directors of the National Safety Council. He also is a member of the Society of Automotive Engineers, Institute of Traffic Engineers, American Institute of Aeronautics and Astronautics, and Human Factors Society.

The Highway Systems Research (HSR) Car, developed by Ford's Traffic Safety and Highway Improvement Department, on the outside looks like any other Mercury convertible. But on the inside it has an array of electronic equipment, sensors, counters, and a gold-plated steering wheel that can pick up the driver's stress and pulse.

Basic ideas for the HSR Car have been under development for more than 12 years. In 1957 Dr. Bruce Greenshields of the University of Michigan developed an instrument called the Drivometer for measuring traffic flow. The Drivometer went through several modifications with additional sensors being added in order to evaluate driver as well as traffic characteristics. Dr. Greenshields' work was sponsored by Ford Motor Company and Ford Motor Company Fund in addition to a research grant by the Federal government.

The HSR Car sensors are connected to a 20-channel magnetic tape recorder in the trunk of the car. The recorder is programmed so that the tape can be fed directly into a computer for analysis of important characteristics of the driver in controlling the car and the motions of the car on the road. Thus, both physiological characteristics and the skill of the driver in various traffic, road, and weather conditions also are recorded.

The computer program for data reduction provides information periodically on a time or distance basis to fit the experimental design. Data from individual variables can be subtotaled and totaled for each test run by the operator of the equipment in the car. In addition to printing the data, the program provides for a card deck which includes driver and trip information, subtotals and totals of the individual variables. In addition, certain derived data, including miles per hour and standard deviations of selected variables, are provided.

Since November, 1967, the HSR Car has been used for a number of research projects across the country. The first production unit now has been installed into a 1969 model Mercury Marquis convertible by Chesapeake Systems Corporation, the company now manufacturing the equipment.

Among organizations participating in the use of the 1967-68 HSR Car have been: Insurance Company of North America, Pennsylvania Department of Public Instruction, North Carolina State University, Texas A & M University, University of California (UCLA), California Department of Motor Vehicles, Iowa State University, and University of South Dakota. The attached table provides a brief summary of the car's use by individual organizations.

For 1969, Ford plans to carry out certain in-company studies, to loan the car for selected research by doctoral candidates, and to offer a lease plan for funded projects.

Several states are developing plans to purchase or lease HSR equipment for driver education and driver licensing research. Another state is proposing to evaluate the effects of certain drugs on night vision.

In a recently completed contract for the National Highway Safety Bureau, headed by the Institute for Educational Development, the HSR equipment was recommended for evaluation of driver efficiency and validation of program effectiveness. Validation of driver characteristics by the HSR equipment not only will be meaningful in relation to driver populations, but related variables will also be meaningful in traffic control and highway design characteristics, as well.

HIGHWAY SYSTEMS RESEARCH CAR

RECENT STUDIES AND REVIEW

November, 1967 -- January, 1968

Insurance Company of North America Philadelphia, Pennsylvania	- *Accident Predictability of Drivers* *Development of a systematic long-range program to discriminate between good and high risk drivers. Testing of company personnel with different driving records.*

February, 1968

Department of Public Instruction State of Pennsylvania Harrisburg, Pennsylvania	- *Demonstration* *Demonstration and preliminary discussion in the area of traffic engineering and human factors.*
Department of Civil Engineering North Carolina State University Raleigh, North Carolina	- *Demonstration Tests* *Traffic flow studies relative to various functional classifications of highways* *Measure the quality of flow on urban arterial streets.*

March, 1968

Department of Psychology Pennsylvania State University University Park Pennsylvania	- *Fatigue Run Demonstration Tests* *Possible use of vehicle to study the problem of alertness and attention to the driving task.* *Fatigue run from Pennsylvania to Dearborn, Michigan*

April, 1968

Highway Transportation Institute
Texas A & M
College Station, Texas - *Doctoral Thesis -- Freeway Merging Research for Department of Transportation's Bureau of Public Roads*

Investigate the feasibility of a merging control system for moving vehicles, to aid freeway ramp drivers in merging without requiring them to stop. Also, test driver visibility and related driver comfort.

Department of Psychology
University of California
Los Angeles, California - *Comparison with UCLA Simulator, Demonstration Tests*

Driving ability as affected by age, test learners for comparative driving behavior, discriminate accident-free and high-accident drivers.

Department of Motor Vehicles
State of California
Sacramento, California - *Driver Tests of High-Risk Subjects*

A pilot program for use in area of driver licensing, reexamination, training.

May, 1968

Department of Education
Iowa State University
Ames, Iowa - *Doctoral Thesis -- Warm-Up Changes in Drivers*

To gather information about the physiological changes that take place in a driver during the first half hour of driving.

Department of Psychology
Iowa State University
Ames, Iowa - *Master's Thesis -- Driver Subtask Stress*

Use adaptive auditory stressor with drivers in the HSR Car. Correlate physical and physiological response measures as *function of stress level and compare with similar laboratory tests.*

June, 1968

Human Factors Laboratory
Psychology Department
University of South Dakota - *Doctoral Thesis -- Rural Driving Patterns and Simulator Comparison*

Investigation of the relationship between simulator based measurement of driver performance and on-the-road performance.

July, 1968

School of Medical Hygiene
University of Minnesota
Minneapolis, Minnesota - *Demonstrations*

Demonstrations before Bureau of Public Roads, university, state and local officials.

AN APPROACH TO DRIVER TRAINING

Harold L. Smith
Founder
Driver Improvement Institute, Inc.

Mr. Smith is a veteran driving instructor, and founder of the Harold Smith Driver Improvement Institute, Inc., in San Diego, California. His background includes training and consultation for professional drivers employed by such giant companies as Ford Motor Company, United Parcel Service, American Gas Association, Bell Telephone Companies, and many other of the nation's major vehicle fleet operators.

Harold Smith began his career in the driver behavior field in 1946. At that time, he opened one of Detroit's first driving schools. He soon realized that the conventional means of instruction taught the prospective driver only the rules of the road and the mechanics of starting, stopping, and steering. The majority of drivers did not learn the kind of habits that lead to years of accident-free driving.

In 1948, Smith reasoned that the eye and the mind are the instruments which turn driving experiences into positive behavior patterns. With the accuracy of this reasoning well established, he developed the five basic steps to improve driver seeing habits. To test his system, he worked for several years as a driver training consultant in various trucking companies--training truck drivers on the job, one at a time, in their respective assigned vehicles. The results were so dramatic that the Ford Motor Company, through its Heavy Truck Department, retained Smith to train teachers of his system. Hence, he worked with safety directors, safety supervisors, and driver trainers representing both common and private carriers in the transportation industry, throughout the country.

The Smith System can be described as "the ultimate in defensive driving"; yet it is the most positive approach to protecting the driver from the irregular and inconsistent actions of other motorists. Rather than count on an indefinite series of reactions to the unanticipated movements of others, the Smith System provides the student with a practical working formula to follow, a positive plan for his driving pattern.

When one doesn't provide proper spacing between his car and the one directly in front, he loses the ability to see all that's up ahead. And up ahead is where he's going. Hopefully, it will not be into an unknown danger situation because the situation is not seen. The driver who rides the vehicle in front too closely is sitting there looking at a big moving billboard with a couple of brake lights that occasionally light up -- and that's the only hint he gets of any changes up front. Such a driver's eyes are leading his car by only one second -- less than three car lengths at a mere 30 miles per hour. This driver lives in a world of surprises -- of the unpleasant variety -- especially when you consider that the average person has a reaction time that takes 3/4 of the time in which he can take corrective action!

Space and visibility are the keys to no-accident driving as I teach it. Space and visibility are not a system of car control as such, but guide the student techniques in driving which provide the closest thing to an accident-free driving guarantee that he will find. The driver who doesn't let himself see where he's going or provide an "out" for his vehicle in terms of space to go when the going gets rough is making himself look bad, feel bad, and is gambling his and others' lives and property for absolutely no reason.

My five rules for safe driving are as follows:

Rule One: Aim high in steering. The first consideration in Space Cushion driving is to find a safe initial path for the vehicle -- a place to put the vehicle and keep it moving in a safe steering path. When driving a motor vehicle at 25 to 30 mph., the driver must have a steering path picked out several hundred feet ahead. You can't throw a ball at a given target or ride a bicycle and keep your balance unless you are looking at the place where you want the ball or bicycle to go. That's how it is with steering a motor vehicle, too. Give a frequent, quick glance well ahead at the center of your individual driving path.

Rule Two: Get the big picture. Few persons realize that we see clearly and distinctly only through a small cone of central eyesight. When you look 100 feet ahead, all you can see with this central eyesight at any given moment is an area 5 feet in diameter. At 1000 feet, this area is only 52 feet wide. There are three parts to the "big picture." It is sidewalk to sidewalk wide and extends from your front bumper to a full city block ahead on the street at city driving speed. It contains both ground (things that won't move) and objects (people, signals). In viewing the "big picture," watch the objects up to one block ahead that will affect you or be affected by you. To get the "big picture," first eliminate physical barriers that would prevent you from seeing a full block down the roadway (buses, etc.). Then establish a minimum of six car-lengths following distance out front.

Rule Three: Keep your eyes moving. It is unnatural for our eyes to stop moving, and yet the most natural things in the world to a driver sitting at a red light is to stare at it. Since staring and fixation of the eyes is an unnatural condition, it certainly hampers one's ability to see outside the three degree cone fixed on the traffic light. Always look right and left before starting up at intersections. And, while you're moving your eyes over the scene in front of you, don't neglect your rear-view mirror. It should be checked every five to eight seconds.

Rule Four: Leave yourself an "out." Don't ever let your wheels get ahead of your eyes. Too few drivers recognize that speed can be too fast for conditions on a clear and bright day in light traffic.

Rule Five: Make sure they see you. The horn, the lights, and eye contact are your communication tools with other drivers and pedestrians. Use these tools positively in a controlled approach -- not a last-minute panic -- so that the other fellow knows you are there and has a good idea of your intentions. When you see a person who is threatening to enter your path and you must depend on that person to stay put until you have safely passed that point, tap your horn in a friendly manner, and do it early enough so that you will get an eye contact from the person with whom you are communicating. The proper use of the horn seems to be a lost art. The horn is used too little to express a friendly message, too often to express wild alarm or to deliver an angry blast. Communication to those in back of you can take the form of hand signals, soft brake taps to warn of slowing, and the turn indicators that are virtually standard equipment on cars today.

The proven rules of the Smith System will help the student only if he remembers them and applies them. He should read and reread them until they are firmly imprinted in his mind.

CLOSED CIRCUIT TELEVISION IN A MOBILE VEHICLE IN TRAFFIC

Alfred C. Finch, Manager
Motor Transportation Department
National Safety Council

Mr. Finch is Manager, Motor Transportation Department, National Safety Council, where he is responsible for the operation of the Council's services to motor fleets throughout the United States and Canada. He supervises staff work for the Motor Transportation Conference and its three sections comprising commercial vehicle, transit and school transportation operations.

Mr. Finch joined the National Safety Council in 1947 and has instituted a variety of program services including supervising the creation of the Motor Fleet Safety Manual, the first text of its kind in the fleet field. He designed a computer program to process the quarter million Safe Driver Awards issued each year to the one-half million drivers enrolled in the Council's fleet program.

He is a graduate of Northwestern University and was Assistant Superintendent of Safety for United Airlines before joining the National Safety Council.

He designed and supervised the system to use closed circuit television in a vehicle in traffic to record action and driver reaction. Through his efforts, a dormant system of judging following distance, called "Timed Interval," was popularized and is fast becoming a standard method of measuring following distance.

The Council's popular defensive driving course was created in his department, and he supervised the pilot testing of the program as it was introduced to the motoring public. The course is an adaptation of the concept of training developed by the National Safety Council to make expert drivers out of professional fleet drivers.

The television program we are about to see is a video-tape replay of a closed circuit television test program conducted in 1968 by the National Safety Council to study the feasibility of CCTV in a motor vehicle in traffic.

The test program, the first of what we hope will be a forerunner of future in-depth studies, was a low budget pilot investigation.

Although inexpensive by comparison to some studies that have been made, we were able to carry out the basic work and to arrive at some definite conclusions concerning the properties and benefits of video recording and its instant playback features.

Initial funds for the project were donated by members of the National Professional Driver Education Association. To each of the dollars totalling $3500.00 that were contributed, the National Safety Council added, on a matching basis, two for one out of our operating funds.

In addition, the Dodge Division of the Chrysler Corporation provided a van-type vehicle for the test, and Sony and Panasonic loaned equipment for the tests.

The feasibility study was conceived in order to assist the work of the Motor Transportation Department of the National Safety Council, responsible for training aids and improvement programs to aid the driving task for professional drivers. Technical assistance was contracted for at the University of Wisconsin, with Frazier Damron, Director of Research and Driver Education, and Lynn Yeazel, Director of Instructional Television, as co-investigators earmarked to carry out the program. The system was designed jointly by the staffs of the Motor Transportation and Research Departments of the National Safety Council and the co-investigators.

The purpose of the study was to see if closed circuit television could accurately mirror the driving task and effectively record traffic actions and driver reactions. Through the facility of instant replay, it was possible to test these factors.

We know that people develop driving habits that are deep-seated, and, often, unless they can see these driving errors, it is hard for them to realize the need for improvement. A study conducted in early 1960 by Dr. James Malfetti, of Columbia University, helped us to establish the fact that a driver, even though he knows he's being tested, cannot conceal bad driving habits for long. If these bad habits are televised, we can obtain a permanent record.

Specific objectives listed in the feasibility study were as follows:

1. Does a video tape recroding system (VTR) accurately depict the real traffic scene and driver responses? Can the camera see enough of the traffic picture to be useful?

2. Is video tape recording "hardware" mechanically and electronically reliable when used in a motor vehicle in traffic and when operated on power provided by the vehicle?

3. How does a basic video tape system compare with a complex system?

   Again, the two questions asked were:

   A. Reliability of monitoring and,
   B. Mechanical and electronic reliability

A basic system consisted of one camera, one recorder, and a monitor for replay.

A complex system consisted of two or more cameras and the electronic gear to show two or more cameras on a single monitor.

The complex system selected consisted of two phases. In Phase 1, two cameras were superimposed on a single screen, and in Phase 2, the screen was split to allow one camera to occupy 70 percent of the screen for traffic and the other camera to occupy the balance of the screen to record electrically instrumented driver reaction. Sony and Panasonic cameras, monitors, video tape recorders, etc. were used for the basic and complex systems.

The television systems chosen required the least power consistent with stable picture replay.

In comparison with more expensive and complex television systems, picture quality was acceptable.

During the test, both cameras were mounted in a fixed position, and the traffic camera picked up an arc extending 45 degrees far out in front of the vehicle. The camera was set as close as possible to the eye level of the driver and with a zoom lens we were able to adjust the picture to relate as close as possible to the image received by the eye of the driver.

For the most part, tests were conducted in fair weather. However, some of the tests were conducted with overcast skies and during rainy weather. Usable pictures were obtained under all types of weather conditions encountered.

The automatic features of camera and recording decks gave consistent results regardless of the direction of the vehicle in traffic. The test course provided an opportunity to head the vehicle in all four directions of the compass.

For purposes of this test, a single driver drove the test course which consisted of approximately 30 minutes of all forms of traffic conditions in the city of Madison, Wisconsin. The route was selected to include as many types of traffic situations as possible, such as streets in the central city business section, residential neighborhoods, school streets, boulevards, expressways, suburban and rural streets, and highways.

Twenty errors were purposely performed in each test run completed. Thirteen runs were man-made on the superimposed picture complex; eight test runs were made on the split screen complex. The driver attempted as nearly as possible, with regard for the safety of the vehicle and others, to perform the driving errors at the same location in traffic for each test run. Density of traffic and problems encountered at the specific time of the error caused some slight variations in the timing and the place that the event occurred.

Driving errors were selected to give us as representative a sampling as possible, with some mistakes subtle and some obvious. Of course, since this was filmed live in traffic, each test run was subject to conditions that existed at the time of the run. Some unintentional errors occurred during the test run, but as a rule these were kept to a minimum.

The feedback we wished to obtain from the test consisted of several types of viewing by various types of people. We chose students at the University, driver education instructors at the University for summer seminars, commercial driving school trainers, and fleet safety supervisors. We assumed at the start of the tests that there would be some differences in judgmental ability of the persons chosen to provide feedback of the system. This was obvious as the tests were conducted, and statistical means were used to establish controls that would minimize the effects of personal judgment differences.

For every test run made, one or more in-vehicle observers were asked to identify driving errors as they occurred. This group was also given a chance to review within twenty-four hours a test tape on a TV studio monitor. They again were asked to record driving errors seen on the television monitor. Another group was asked to give us feedback by viewing the television monitor in the studio only. Both groups were given an opportunity to react also to a delayed viewing of the televised tape replay.

Although a much more detailed report of the statistics involved in the feasibility study will appear in the National Safety Council's Research Journal, and there has been an introductory story in the Council's Traffic Safety magazine, we will briefly describe the comparative results of the tests.

We chose a 75 percent error recognition factor as a possible cut-off point to evaluate feasibility. It was encouraging to note that the data revealed, in all instances, a 75 percent factor or more on an average as a recognition level.

In Phase 1, the control group recognized 96 percent of the errors they identified live versus those they identified during the initial video tape viewing. The Phase 2 control group scored even better.

Since the control group in both phases represented the real-life or ideal observation, all other scores were compared with these mean scores. Standard deviation for Phase 1 from the mean did not exceed 3.67 and had a 2.61 average. The live mean averaged 15.9 out of 20 errors. The replay averaged 15.2 errors. Standard deviation for Phase 2 did not exceed 3.27 and averaged 2.34. The live mean in Phase 2 averaged 11.8 out of 20 errors. The replay averaged 16.2 errors.

The conclusions we have reached in a report being prepared on the feasibility study are as follows:

1. A basic video system reproduces the real traffic scene with sufficient accuracy to obtain at least a 75 percent recognition of driving errors.

2. A complex system with screen splitting capability reproduces the real traffic scene to obtain 82 percent recognition of driving errors, which is better than the basic system of 75 percent.

3. The TV only observers from Phase 1 who were given equal observational experience to the delayed TV group by a second TV exposure scored higher (81 percent) than the delayed TV group (77.4 percent) with live in-van experience.

4. The TV only observers for Phase 2, when given equal observational experience to delayed TV group by second exposure, scored the same or 96.4 percent as delayed television group with in-van experience.

5. Observational experiences, related to the recognition of driving errors, can be elicited best from live in-van experience when followed by immediate television playback.

6. Present "state of the art" systems conforming to the specifications of the study are mechanically and electronically reliable to the extent that it is most practical to use them in mobile vehicular activities.

The feasibility study should be followed by in-depth studies using guest drivers so that application of the principles discovered in the study can be applied and measured.

STATE TESTS, RULES, AND REGULATIONS FOR COMMERCIAL SCHOOLS AND INSTRUCTORS

This phase of the program provided an opportunity for an informal report and discussion of the variations in state regulations regarding the licensing of commercial driving schools. Three panel members representing different parts of the country first presented an overall view of the regulations in their particular states, and then answered questions from the audience.

JOHN S. WOODS--MASSACHUSETTS

President, Professional Driver Education Association
of Massachusetts

Mr. Woods was educated in the Quincy, Massachusetts, school system. He served in the United States Navy for three years during World War II. After his discharge, Mr. Woods entered the driver education business as a part-time driver education teacher, and subsequently as a full-time instructor for about ten years.

In 1959, John Woods and his brother, William, formed their own driving school, Woods' South Shore Auto School, Inc., in Braintree, Massachusetts. During the past ten years, they have expanded to four locations, which includes offices and classrooms. The school has 10 automobiles for driver education purposes, and employs 20 people.

Mr. Woods is a member of the Braintree Rotary, President of the Braintree Business & Professional Association, President of the Professional Driver Education Association of Massachusetts, and serves on the Board of Directors of the National Professional Driver Education Association. Prior to serving as the President of the State Association, Mr. Woods was its Vice President for two terms. He has been an advisor on state legislation with regard to traffic safety for many years.

Massachusetts first began licensing commercial schools in 1953, at which time a separate department within the Registry of Motor Vehicles was established for their control. All schools were required to keep a single entry ledger of names and addresses and a lesson record card on each pupil receiving instruction from the school.

In 1957, the Registry granted the right to the commercial schools to participate in the 30 and 6 driver education program with the same benefits in insurance deductions that were being received from the course given in the secondary schools. The Department of Public Safety required that each commercial school classroom comply with all safety standards required of any school classroom (fireproofing, lighting, etc.).

Until two years ago, a high school could issue a certificate on its own letterhead. Now, high school certificates of course completion must be issued by the Registry. These certificates allow the students to get their licenses at 16 1/2 years of age instead of 17, and give them an insurance discount until age 25.

This year we are recommending to the state changes in conduct and the regulation of commercial schools. One such recommendation will be a change in program requirements. We are asking for a program requiring 30 classroom hours and 8 hours of behind-the-wheel instruction -- a two hour increase in on-the-road instruction. Some other improvements we hope to implement include a definition of a driving school that classifies the school as to the types of services it offers (e.g., a full program or only behind-the-wheel instruction). We also want to define the term "driving instructor" to show whether he is a classroom or a behind-the-wheel instructor. At the present time, the behind-the-wheel instructor is required to complete a state-approved 45-hour course in driver education, and an additional advanced course of 45 hours is required to teach in the classroom. We have recommended that the classroom instructor be required to have a minimum of 60 college semester hours along with the above courses.

This past year, 66,000 teenagers received their certificates, and approximately 50,000 of these were received from commercial schools receiving no subsidization.

THAD RAROGIEWICZ--OHIO
Midwest Regional Director, NPDEA

Mr. Rarogiewicz is presently the owner and president, respectively, of two professional driving schools: the A-Easy Method-National Driving School located in Canton, Ohio, which has been in business since November, 1954, and the A-Academy Driving School, Inc., located in Akron, Ohio, which has been in business since October, 1964.

Driver education courses at the University of Houston, the University of Texas, and at Ohio University have been completed by Mr. Rarogiewicz, who has also graduated from the 40 hour Smith System teacher training course given by Harold L. Smith. In his own communities he has given voluntarily of his time for defensive driving clinics, driver improvement lectures, and other traffic safety projects.

Mr. Rarogiewicz was the charter Secretary of the National Professional Driver Education Association serving in this capacity for four years, and he was also the charter President of the Ohio Professional Driver Education Association serving for a period of three years. He is presently the Midwest Regional Director of the NPDEA, and the Vice President of OPDEA. He is one of four persons on the North American continent to hold a place on the NPDEA National Commission on Driving School Management as well as being one of four members to hold a lifetime seat on the NPDEA Board of Directors. Serving on the NPDEA Curriculum Policy Committee, he helped develop the New Driver's Guide and the NPDEA Recommended Course Content Standards.

Some of his professional affiliations include being a member of many years standing of the American Driver & Traffic Safety Association, the Ohio Driver & Safety Education Association, the Council for Basic Education, and the National Safety Council.

The Ohio licensing law, rules, and regulations went into effect on January 1, 1958. The commercial schools were placed under the jurisdiction of the Department of Highway Safety and under the supervision of the State Highway Patrol. When the rules and regulations first went into effect, the commercial school owners were alarmed because of fear of police supervision and because no one had attempted to explain the need for such regulation. However, within 18 months the school owners were calling for stiffer regulations.

Three types of schools were set up under the licensing law. Type "A" schools could teach behind-the-wheel and in the classroom; type "B" could teach behind-the-wheel; and type "C" could teach only in the classroom. The law calls for the owner or manager of a commercial school to have completed a college safety course, and all instructors in our schools must have 40 hours of in-service training before they may apply for an instructor's license.

In January of 1967, we finally were able to get a revision in our rules and regulations. The original "A, B, C" school concept was eliminated. We now have "A," "B," "C," and "D" classifications, but on a different rating scale. Today, the class "A" school must give both behind-the-wheel and classroom instruction, the class "B" school gives motorcycle training only, the class "C" school gives truck driver training only, and the class "D" school is a truck driver training school whose home office is located outside of Ohio. Our time standard was changed to require eight hours of in-car and eight hours of classroom work. All class "A" schools must comply.

On July 1, 1969, another change will go into effect. A mandatory "under 18" law will require each youth to finish a state-approved course in order to get his driver's license. The approved commercial driving school course will consist of eight hours of in-car plus 10 hours of classroom work. The high school course will consist of 36 hours of class work, 18 hours of observation time in the car, and six hours of driving time.

We have a program in Ohio whereby public schools can contract with commercial schools to do the behind-the-wheel work, provided that credit isn't given toward graduation. When a commercial school contracts for this work, it must comply with the course content standard of the high school.

The biggest problem of the driving school industry in Ohio is a lack of enforcement of the present laws, which is due to inadequate manpower in our State Highway Patrol.

RICHARD DOOTSON--CALIFORNIA

Past Chairman, Driving School Association of California, Los Angeles Chapter

Mr. Dootson graduated from the University of Washington majoring in economics and business. He also studied at George Washington University, Washington D.C., and at the University of Southern California, Los Angeles.

While attending the University of Washington, he taught driver training at the Seattle Driving School and while attending the University of Southern California, taught driver training for the White Driving School in Long Beach, California. After finishing school, he purchased the White Driving School in Long Beach and established the Wright Driving Schools in Santa Ana, Riverside, Pomona, and Whittier, California.

In 1964 all offices were combined under one name, "Dootson Driving Schools" and outlying offices were franchised. The chain presently consists of ten offices, seven franchised and three run by the home office in Temple City, California. The Dootson chain has been engaged for driver education and driver training by the Brown Military Academy, California State Vocational Rehabilitation Center, and six other private and parochial secondary schools.

Mr. Dootson is past Chapter Chairman of the Los Angeles Chapter of the Driving School Association of California and is presently chairman of the textbook committee for the National Professional Driving School Association.

I would like to give you a brief view of some of our laws and regulations by acquainting you with the process one must go through in order to open a driving school in California. The location of the school must be commercially zoned and approved. The Department of Motor Vehicles must do a complete character check, a driving record check, and a criminal record check. An applicant must have a certificate of insurability, an eye examination, a comprehensive examination on the complete vehicle code, and an inspection of facilities and vehicles must be made, checking for things such as dual control, adjustable seats, lights, etc. The owner of a school must keep a complete record of every hour of instruction, showing the date, the type of instruction, and the amount of time devoted to each type of instruction. In addition, one applying for a school owner's license must have taught in California for a total of 1000 hours. There is no reciprocity in the 1000 hours stipulation for those who have taught in other states, unless the individual has a teaching certificate. Only on this condition will the requirement be waived.

I feel that these strict rules and regulations are needed in order to select as school owners only those men who want to devote a lifetime to the profession. We are working toward even stricter standards, such as requiring 2000 hours of instruction rather than 1000, and requiring a security bond of an owner before he can open a school. We also would like to incorporate stricter instructor requirements into our laws.

A PUBLIC-COMMERCIAL SCHOOL RELATIONSHIP

Donald E. Bruggeman, President
Ohio Professional Driver Education Association

Mr. Bruggeman is a native of Cleveland, Ohio. He received his B.A. degree from Western Michigan University in 1958, majoring in social studies and minoring in psychology and education. The next four years were spent teaching history, social studies and driver education in the public schools of Cleveland and Lakewood. During the summer of 1960, he studied at Oriel College, Oxford University, England.

In 1962, Mr. Bruggeman made an unsuccessful bid for election to the Ohio House of Representatives. He spent the following year working toward an M.A. at Case-Western Reserve University. It was during this year that he became interested in the field of professional driver education and opened his first commercial driver training school.

Mr. Bruggeman feels that he is able to look at driver education and training from all angles. He has worked as a high school teacher in driver education programs, both with and without simulators. He has worked as a professional driving instructor and now is the owner of two commercial driver training schools. At the present time his schools are handling the behind-the-wheel training for three public school systems in Northeastern Ohio. They will be responsible for training 800 to 1000 high school students during the 1968-69 school year.

Mr. Bruggeman was recently elected to a second term as President of the Ohio Professional Driver Education Association. He is also a member of the Board of Directors of the National Professional Driver Education Association.

First, let me explain that there is a dual standard in Ohio's "under-18" requirements. For the high schools, 36 classroom hours are required, with 18 hours of observation and 6 hours of behind-the-wheel instruction. For the commercial school, the requirements are 8 hours of classroom and 8 hours of behind-the-wheel training.

I would like to trace briefly the history of the commercial school-public school relationship from its inception in 1958 to the present. In 1958 the first public schools contracted with commercial schools to do the behind-the-wheel phase of their driver training program. In 1966, the Federal Highway Safety Act called for each state to develop comprehensive driver education programs. The "Little Hoover Commission" report in Ohio recommended in 1967 that school boards contract with commercial driving schools to do the behind-the-wheel phase. That same year, Ohio passed the Omnibus Highway Safety Bill that required all persons under 18 years of age to take a driver training course from either a commercial driving school or from a high school prior to obtaining a drivers' license, and it required the State to reimburse school systems a maximum of $30.00 for all regularly enrolled students who completed the course. It stated that a school system could contract with a commercial school that had been in business at least two years to do all or part of the driver education program. However, it stipulated that certified teachers must be used for the classroom phase. The bill required that commercial schools follow the course content set forth by the State Board of Education. It did not, however, give the Board the power to establish requirements for instructors; they are licensed under regulations set up by the Department of Highway Safety.

In May of 1968, the Board of Education decreed that commercial instructors teaching in high school programs must take a two-semester-hour college course in driver education to be offered at State University before starting to teach. When it became obvious in June of that year that the designated course would not be available, the school owners filed an objection on the grounds that the Board of Education overstepped its authority. The Common Pleas Court ruled in favor of the Board. However, in January of 1969 the Appellate Court reversed the decision of the lower court, and the college course requirement was dropped.

At the present time, twenty-five to thirty high school districts are contracting with commercial schools in Ohio. The school superintendents involved seem very happy with the program. The high school driver education teachers' attitudes vary from indifference to resentment. For example, we have asked the teachers what grading criteria they would like us to use. They have given us no answers, and generally don't even ask us for the student's grade in behind-the-wheel instruction. I know of only one instance in which a school system has reverted to using certified personnel entirely after having used a commercial school. In this particular case, someone "sold" the school board on a program involving simulators.

XI BIOGRAPHICAL SKETCHES

SEMINAR LEADERS,

GENERAL SESSION CHAIRMEN,

AND SEMINAR RECORDERS

JAMES E. AARON

Dr. Aaron received his B.S. degree form the University of Illinois in 1950, and his M.S. from the same institution in 1951. He did advanced graduate work at both the University of Illinois and Purdue, and did doctorate work at New York University from 1956-59, receiving his Ed.D. in safety education in 1960.

He taught driver education at Granite City High School from 1951-56, at NYU from 1956-57, and has been teaching driver and safety education at Southern Illinois University since 1957. He is a member of the graduate faculty at Southern Illinois University.

Dr. Aaron is currently President of the American Driver and Traffic Safety Education Association--NEA. He was President of the Illinois Driver Education Association in 1956, and Vice President in 1955. He served as a delegate to the President's Safety Conference in 1956, 1958, and 1963. He is a member of the Governor's Official Traffic Safety Coordinating Committee, State of Illinois, a consultant to the Office of Public Instruction of the State of Illinois, and a member of many other committees and boards dealing with driver and traffic safety education.

Some of Dr. Aaron's writings include: Aaron, J., Shafter, A., The Police Officer and Alcoholism, Charles Thomas, 1963; Aaron, J., Strasser, M., Driver and Traffic Safety Education: Content, Methods and Organization, The Macmillan Company, 1966; Aaron, James E., "The Real Cause of Accidents", Popular Medicine, Popular Medicine Publishing Company, Inc., January 1962, pp. 70-74.

His professional affiliations include The Higher Education Association, the Illinois High School and College Driver Education Association, the National Safety Council--Driver Education Section--Higher Education Section, Phi Delta Kappa, and the American Academy of Safety Education.

MILES H. BARKER

Mr. Barker is President of the 4 Lakes Driver Training School of Madison, Wisconsin and is serving his second year as President of the Wisconsin Professional Driver Education Association. He is also serving his second year on the Board of Directors of the National Professional Driver Education Association.

He attended the University of Chicago for one year and then attended Iowa State University for two years, majoring in engineering. After spending two years in the Army, he returned to Iowa State. He graduated in 1947 with a B.S. degree in industrial economics and a minor in psychology. His supervising professor in his minor was Alvah R. Lauer, Chairman of the Psychology Department and one of the pioneers in driver education.

In 1947 he began employment with the Wisconsin Rapids Gas and Electric Company and City Gas Service Incorporated (a wholesaler and retailer of liquified petroleum gas and gas appliances). He attained the rank of Executive Vice President in 1957, a position he held until 1960 when the companies were sold. Between 1954 and 1960 he served on the board and held various offices in the Wisconsin Liquified Petroleum Gas Association, serving as its president in 1958. He remained in various managerial capacities for three years under the new ownership. In 1964 he became associated with an investment banking firm and in 1965 became very interested in the commercial driver training school industry, and started the 4 Lakes Driver Training School in Madison, Wisconsin.

JAMES R. BERRY

Mr. Berry is Director of the Transportation Safety Program at the University of Iowa. He joined the University of Iowa in 1968 to develop a research program in transportation safety. Prior to this assignment, Mr. Berry served as Program Director of Education and Training for the Insurance Institute for Highway Safety. He served seven years with that national highway safety organization in Washington, D.C.

He graduated from the University of Northern Iowa, and holds a master's degree in safety education from New York University. He is a member of the National Safety Council's Education and Training Committee, the Advisory Committee to the Driver Improvement Program, and is Past National Chairman of the Council's Driver Education Section, School and College Conference.

DALE E. BUSSIS

Dr. Bussis received the A.B. degree from Calvin College in 1950, and the B.D. from Princeton Theological Seminary in 1954. He was granted the Ed.D. degree in 1963 from Teachers College-Columbia University, where he majored in the teaching of speech and minored in higher education.

Prior to joining IED, Dr. Bussis was an Assistant Professor of Speech and Director of Student Studies from 1962-64 at Princeton Theological Seminary. From 1964-66 he was a Research Associate at Studies in Higher Education in Philadelphia, an organization which offered consultant services to independent colleges and divinity schools.

Dr. Bussis joined the staff of the Institute for Educational Development in June 1966 as a Program Associate. He later served as Assistant Secretary and now holds the position of Secretary of the corporation. He has worked closely with many of the projects in which IED has been engaged, primarily the establishment and management of the university-based evaluation and research centers for Project Head Start, and the comprehensive planning for higher education in the State of Vermont and in the State of Maine. Dr. Bussis was a member of the IED Study Group for the development of a plan for evaluating the effectiveness of driver education and training programs.

JOSEPH C. CASEY

Mr. Casey is Director of Driver and Traffic Safety Education at Lakewood High School in Lakewood, Ohio, and is on the faculty at Cleveland State University. He received a B.A. at the University of Northern Iowa, and a M.A. in driver education at Michigan State University in 1962. He received a fellowship in driver and traffic safety from New York University in 1965.

He has contributed to several textbooks in driver education. He is a past President of the Ohio Driver and Traffic Safety Education Association, and is currently serving as this association's Second Vice President and as editor of its newsletter. He has also served on the Aetna Educational Systems Curriculum Advisory Committee.

Last year Mr. Casey was the recipient of the Martha Holden Jennings teacher award, and this year he was chosen as the Lakewood Jaycees Outstanding Young Educator Award winner.

THOMAS M. CHENEY

Mr. Cheney has recently been elected to serve a second term as President of the National Professional Driver Education Association. He acted as Secretary to this Association for four years prior to being elected President.

He has been engaged in the field of education since 1936. After graduating from UCLA in 1935 with a B.A. degree in political science, he received a M.S. degree in education from USC in 1936. He received his administrative credential, and in 1940 he moved to Trona as school administrator to guide the design of a building for a unified school district. At this time he was active in the California School Administrators' Association, where he served as President of Section 22 and was a member of the State Representative Council. While in Trona, he was a member of the California Association of Public School Superintendents, National Education Association, the California Teachers' Association, and the National Association of Public School Superintendents.

He joined his two brothers in the driving school business in the 1940's. He is a past President of the Driving School Association of California and has been active for many years in Sacramento working for good legislation for the driving school industry. In the last few years he has also made numerous contributions, as a member of NPDEA legislative committee, to federal legislation relating to traffic safety. He was chairman of the NPDEA Textbook Committee and worked closely with Dr. Strasser and Dr. Aarons in producing the New Driver's Guide, the textbook written especially for the private professional driving schools and endorsed by NPDEA.

RICHARD D. ELLIS

Mr. Ellis is Director of the Traffic Education Program and Assistant Professor in the Professional Preparation Program of Traffic Education at the State University at Albany, Albany, N.Y. He received Bachelor and Master of Science degrees and certification in health and physical education from the State University of New York at Cortland in 1951 and 1954, respectively.

From 1963 to 1966, Mr. Ellis served as the New York State Supervisor of Driver and Safety Education for the State Education Department. Prior to this, he spent one year as a Research Assistant in the Safety Research and Education Project at Teachers College, Columbia University; one year teaching the general safety education and the teacher preparation courses at Teachers College, Columbia; and eleven years teaching high school and adult traffic safety education in Whitesboro, New York.

Mr. Ellis is an active member of the Driver and Safety Educators Association of New York State (he was President of this Association from 1960-1963); a member of the Board of Directors of the American Driver and Traffic Safety Education Association, NEA, 1962-1965; and was President of the American Driver and Traffic Safety Education Association, NEA, from 1967-1968.

Among his published articles are: "What is a Driver Educator?", a National Safety Council Safety Education publication, and "A Professional Critique of Research on Effective Practice Driving Teaching," which appeared in the National Commission on Safety Education's Journal, News and Views.

ROBERT T. FILEP

Dr. Filep is Director of Studies of the Insititue for Educational Development where he is responsible for major studies and the Western Regional office. At the present time he is directing the Supermarket Discovery Center, an educational program for three and four year olds and their parents; heading two innovative symposia for the National Highway Safety Bureau; and analyzing and designing a model in-service teacher education program for the State of California.

Prior to Dr. Filep's affiliation with IED, he was an Education Systems Scientist for System Development Corporation where he directed a number of systems requirement, feasibility, and research studies dealing with the humanistic use of computers in education. In 1959, Dr. Filep was appointed Dean of Admissions and Financial Aid at Mills College of Education in New York City. He later became Secretary of the Center for Programmed Instruction, Inc., in New York City. In 1963, Dr. Filep received an appointment as Associate Investigator of the Cinema Research Division at the University of Southern California, where he taught and periodically teaches graduate and undergraduate level courses. He received his Ph.D. from U.S.C., his M.A. from Columbia University and his B.S. from Rutgers University.

Dr. Filep is currently President-elect of the National Society for Programmed Instruction, and is a member of the American Educational Research Association, American Psychological Association, American Association for the Advancement of Science, American Personnel and Guidance Association, the Educational Media Council, EDUCOM (Interuniversity Communications Council) Task Force on Continuing Education, and Phi Delta Kappa

U. HALE GAMMILL, II

Mr. Gammill received his Bachelor of Arts degree in education in 1953 from the Arizona State University, where he also received his master's degree in public school administration in 1959. Gammill was safety director of a Phoenix school district from 1953 through 1965. The driver education programs at Brophy Prep College, St. Mary's High School, and Xavier High School were all started by Gammill during the mid-fifties, and are still in operation.

The Arizona School of Driving was started in 1940 as a part-time operation while Gammill was driving for a local bus company. This part-time operation of the driving school continued until 1965 when he resigned as safety director of the Phoenix school district. In July of 1968 he purchased the International, San Francisco, and Continental Driving Schools in Northern California. He and his son, U. Hale Gammill III, have the largest driving school operations in Arizona and Northern California.

The Arizona Chapter, American Society of Safety Engineers, elected him President for the two terms of 1966 and 1967. Gammill served on the Steering Committee for the Annual Arizona Safety Congress during the years 1966, 1967, and 1968. In 1967, he represented Governor Jack Williams of Arizona in making a presentation at the Annual Western Safety Congress in Los Angeles, California. Mr. Gammil is a charter member of the National Professional Driver Education Association. He has served on the Board of Directors almost since its organization.

CISSIE E. GIEDA

Mrs. Gieda, a resident of Fulton, Maryland, has been a high school teacher of driver education for over twenty years. She has also been safety coordinator and adult advisor to the Montgomery County Teen-Age Safety Council since its organization. She was one of the charter members of the Driver Education Teachers' Association of Maryland. She is a life member of the NEA and the Maryland State Teachers' Association. Present at the first national conference and founding of American Driver and Traffic Safety Education Association, she is presently a member of the Board of Directors of this association, representing the Northeast region.

A pioneer in the field of driver and traffic safety, she has been the recipient of many state and national awards. Most recently, she was selected to attend and participate in a Top-Level Conference Critical Issues Affecting the Schools in an Era of Change.

Mrs. Gieda received a Sc.B. degree from Dickinson College, Carlisle, Pennsylvania, and completed graduate work at Rutgers, Columbia, and The American University.

ROBERT D. GOFF

Mr. Goff received a B.A. in political science from the University of Wisconsin in 1940. A Master of Arts in political science was granted him by the University of Utah in 1963. He is currently working toward his doctoral degree at the same institution.

Inspired by Amos Neyhart while attending a driver education workshop at the University of Wisconsin in 1938, he since has participated in graduate level workshops and seminars in traffic safety education at the Universities of California, Utah, Washington, Utah State, Pennsylvania State, Iowa State, Michigan State, New York, and San Jose State. He has attended over 45 national and regional conferences in traffic safety, from New York to California. He is a member of the American Driver & Traffic Safety Education Association, and has attended 10 out of 12 ADTSEA national conferences. He is currently Secretary of their Research Division.

Mr. Goff has taught teacher preparation courses at the University of Utah for 25 quarters and taught for two years in the Job Corps. He has had articles published in the *Caldea Calendar* and *Traffic Safety*. He has written a weekly newspaper column, and a five-year series of daily radio traffic safety messages. *Who's Who in the West*, and the *Dictionary of International Biography* both list Mr. Goff.

PAUL R. HALULA

Mr. Halula is presently President of the American Universal Driver Training Schools of San Francisco, California. He holds the office of the Secretary for the National Professional Driver Education Association, Inc., and is Vice President of the Driving School Association of California. He is also the editor of the NPDEA Newsletter, which has distribution throughout the United States and Canada. A graduate of St. Vincent College of Pennsylvania with a B.A. degree in English, Mr. Halula will receive his M.A. degree from San Francisco State College in educational psychology.

While on the legislative committee for the Driving School Association of California, he submitted various proposals to the Department of Motor Vehicles on recommended laws for regulating private driving schools and instructors' credentialling for private driving schools.

In June 1968, he formed the Driver Education and Training Center, a nonprofit corporation devoted to driver education and driver improvement. Its objectives are: to foster, promote, and encourage traffic safety through public education and driver training, and to disseminate information on traffic safety and driver education through publications and lectures.

GEORGE R. HENSEL

Mr. Hensel is President of the California Safety Center, Inc., which owns and operates the California Driving School. From its Los Angeles office at its peak, it operates a fleet of 82 fully dual-controlled cars and is staffed by over 100 employees. In addition to the Los Angeles office, there are branch offices in Bakersfield and San Diego, California.

Mr. Hensel, who has a bachelor's degree in business, has been head of the firm for 16 years. He is also past President of the Driving School Association of California, active in legislative affairs in California for the Driving School Association, and a past member of the National Professional Driver Education Association Board of Directors.

Some of his other responsibilities include being President of the Hensel Investment Company and Vice President of the East Los Angeles Investment Corporation and the Country Club Investment Corporation. He is a member of the Board of the Rio Hondo Publishing Company and of the Advisory Board for Woodbury College. Mr. Hensel is chairman of Assemblyman Jack Fenton's Legislative Committee on Transportation, a member of the American Driver Education Association, an associate member of the California Driver Education Association, and a member of the Los Angeles County Driver Education Association and the American Driver and Traffic Safety Education Association.

PAUL F. HILL

Mr. Hill is presently the Assistant General Manager of the National Safety Council and supervises traffic, school and college, home and recreational safety programs. Prior to his present position, he was Manager of the Council's field service program and prior to that, served as a District Director for the Western states.

Before joining the Council in 1946, Mr. Hill served for 38 months as an Educational Planning Officer in the 9th Naval District. Prior to his Naval service, he directed the Traffic Safety Program for the State of Iowa (1939 to 1942). After graduating from the University of Northern Iowa in 1934, Mr. Hill taught for five years in the Tipton and Des Moines City Schools. His graduate work was taken at the University of Iowa, Iowa City, and the Iowa State University, Ames. Mr. Hill has also taken special management courses at Stanford, University of Santa Clara, and Northwestern University. He is presently a participating instructor in the traffic management courses being offered by New York University-The Center for Safety.

Since 1946, Mr. Hill has served in many advisory and consulting capacities for White House conferences and state conferences.

HAROLD J. HOLMES

Mr. Holmes has been Director of Driver Education of the National Safety Council since 1967. His education includes naval aviation at Monmouth College, Loras College, and the University of Iowa. Being commissioned at NAS Pensacola in 1945, he served in U.S. Naval Aviation as fighter and jet pilot until 1962 (active duty and reserves). He received a B.S. degree from the University of Minnesota in 1949, and an M.Ed. in 1950. A certificate in Traffic Safety Management was granted him by New York University in 1960. He attended the Institute for Organizational Management at Syracuse University in 1963.

In 1956 and 1958 Mr. Holmes was Special Representative to The President's Committee for Traffic Safety (PCTS). He joined the National Safety Council staff as district director for Illinois and Indiana in 1958. The year 1960 he was promoted to manager of the church department of NSC, serving until 1965.

He serves as PERT analyst and as an instructor in the Council's new systems course. He is NSC's aviation safety consultant. He holds a commercial and a chief flight instructor license in aviation (S and MEL).

Mr. Holmes has published articles on driver education, safety, and aviation. He recently authored five articles on aviation for an aerospace encyclopedia. Other articles include: "Does Your School Have Driver Education?", South Dakota Education Association Journal, March, 1955; "A Background Paper--Traffic Safety" in Concern, Division of Temperance and General Welfare, The Methodist Church, 1962; "Aviation Psychology Manual for Flight Instructors," Chicago Teachers College, 1963. He assisted in writing the FAA Instructor's Handbook in 1964.

JOHN L. KENNEDY

Dr. Kennedy, a Vice President of the Institute for Educational Development, has broad interests and experience in the areas of psychology and the behavioral sciences and has held important posts in administration and research and development in the academic world, government, and nonprofit groups.

After educational preparation which included an A.B. in psychology at Stanford University, an M.A. and a Ph.D. in psychology in 1937 from Brown University and a two-year post-doctoral fellowship at Stanford, he was appointed assistant professor of psychology at Tufts University. He became head of the Psychology Department at Tufts in 1945 and also founded and headed the Institute of Applied Experimental Psychology, a research center for human engineering.

Dr. Kennedy was the first professional psychologist to join the Social Science Division of the RAND Corporation, Santa Monica, California in 1951 and headed the Systems Research Laboratory there until 1957. In 1954-55, he was a member of the first group of Fellows at the new Center for Advanced Study in the Behavioral Sciences.

In 1957, Dr. Kennedy became Dorman T. Warren Professor of Psychology at Princeton University and, in 1958, he became Chairman of the Department of Psychology at Princeton University, a position he left to join the newly-chartered Institute for Educational Development in 1966.

Dr. Kennedy was a member of the Accident Prevention Study Section, National Institutes of Health, from 1963-67, and was chairman of IED's study group on the evaluation of driver education and training. He is currently chairing IED's group dealing with evaluation of driver licensing practices and is the director of the two national symposia on evaluation of driver education and training.

JOHN C. KERRICK

Mr. Kerrick is Director of the Driver Services Division of the American Association of Motor Vehicle Administrators. He has served in this position since the AAMVA first inaugurated a specialized Driver License Program early in 1960.

Before joining the AAMVA staff in Washington, Mr. Kerrick had been officially connected with motor vehicle administration, primarily in the field of driver licensing, in the state of Oregon for 31 years. His service included 14 years as manager of the Oregon Driver License Division. Within this period he planned and implemented the state's first Driver Improvement Program. He has written drivers' manuals and manuals for driver license examiners.

Long active in American Association for Motor Vehicle Administrators, Mr. Kerrick served for three years as chairman of the Association's Committee on Driver Licensing and he has served on many other national committees appointed to consider special problems in motor vehicle administration.

His present position involves working with licensing agencies in all states.and in all Canadian provinces with an objective of continuously improving the quality and the effectiveness of driver control through licensing procedures, and doing so in a manner that is recognized as equitable and fair to all.

DEWAYNE T. MARSHMAN

Mr. Marshman is presently the President of Minnesota Driving School, Inc. He is also the President of the Minnesota Professional Driver Training Association and a member of the Board of Directors of the National Professional Driver Education Association, serving as Chairman of the Standards and Ethics Committee.

He has been involved with driver training for the past seven years, with a background in all phases, from field instructor to management. He has been active at both city and state levels in the passing of legislation for improved driver training and traffic safety.

Prior to his driver training interest, Mr. Marshman spent six years in restaurant management and twelve years as a computer programmer and system analyst load dispatcher for Northern States Power Company.

FREDERICK L. McGUIRE

Frederick L. McGuire has been an Associate Professor of Medical Psychology at the University of California, Irvine, College of Medicine since 1965. He received his Ph.D. from New York University in 1957.

Prior to his present position at the University of California, Irvine, Dr. McGuire was Associate Professor of Psychiatry and Head of the Division of Psychology at the University of Mississippi School of Medicine from 1960-1965. He was Project Director at the Naval Medical Neuropsychiatric Research Unit in San Diego, California, from 1959-1960. From 1957-1960 he was head of the Psychology Department of the U.S. Naval Hospital in San Diego, and he held the same position at the U.S. Naval Hospital in Philadelphia from 1955-1957. From 1953-1955, he was head of the Psychology Department at the U.S. Naval Medical Field Research Laboratory in Camp Lejeune, North Carolina, and from 1952-1953 he was a Staff Psychologist at the U.S. Naval Hospital at Bethesda, Maryland.

Dr. McGuire has been engaged in accident research since 1952. He received the Metropolitan Life Award of Honor for Research in Accident Prevention in 1968. He presently serves as Chief of Research for the Metropolitan State Hospital. He is a member of the Research Committee, American Society of Safety Engineers; Chairman of the Committee on Accident Research, Division 22, American Psychological Association; and is an active member of several committees of the National Accident Society.

HEINZ NAUMANN

Mr. Naumann is President of the Central Driving School Limited, Toronto, Ontario, Canada. He is also serving as Vice President and Canadian Regional Director of the National Professional Driver Education Association. He received his education in Germany where he was granted his Senior Matriculation, and subsequently attended business college where he studied banking and personnel administration for two years. Before emigrating to Canada in 1953, he held positions with the U.S. Army Headquarters as Personnel Assistant, at which time he took further courses in job instruction and relations training. He was also with the American Express Company as branch manager.

Prior to the opening of his driver training school in 1961, Mr. Naumann occupied positions with the Royal Bank of Canada in banking and personnel administration. He has since completed several certificate courses for instructors in driver and traffic education under Dr. Harry Fletcher and Professor Amos Neyhart, Penn State University Traffic Safety Institute, and has graduated from the teacher preparation course in driver education offered by the Ontario Departments of Transport and Education. He has lectured on many driver education, instructor and teacher courses at the Ontario Safety League, Ryerson Institute, and other organizations. He actively participates in association work in the driver education field across the United States and Canada. He is Past Chairman of the National Commission on Driving School Management which conducts seminars in both countries. Mr. Naumann also serves as a Director of the Ontario Professional Driver Education Association.

WILLIAM J. RHODES

Dr. Rhodes, Professor of Education in the Health and Physical Education Department at the University of Houston, has helped make the University's driver education program one of the most outstanding in the state. He has been directing the Traffic Safety Education Program since he received a doctorate in education at the University in 1950. While working on his doctor's degree, he served as football line coach at the University of Houston in 1948-49.

He received a bachelor's degree from the University of Texas in 1940 and a master's degree from the same University in 1947. Between the bachelor's degree and the master's degree he served in the United States Navy four years as physical and military instructor for naval aviation cadets, specializing in survival; land, sea and air.

Active in education on the city, state, and national as well as the university level, Dr. Rhodes is a member of the Board of Directors of the Texas Driver and Traffic Safety Education Association, a member of the Texas State Teachers Association and the National Education Association. He is the Chairman, Emergency Squads, American Red Cross, Flotilla Commander of the U.S. Coast Guard Auxillary, member of Phi Delta Kappa, (education honor fraternity) and American Society of Safety Engineers. The University of Houston educator also assists state and national professional driver education associations as well as the local schools as a consultant on curriculum and research in traffic safety.

MARLAND K. STRASSER

Dr. Strasser is Coordinator of Safety and Driver Education at San Jose State College, San Jose, California. He has been a Professor at San Jose State since 1959.

He received his B.A. from the University of California (Berkeley) in 1938 and was awarded his M.A. from the same institution in 1939. He received his Ed.D. from the Center for Safety Education at New York University in 1950.

Prior to his present position, Dr. Strasser was employed by the accident prevention department of the Association of Casualty and Surety Companies in New York City. He was Assistant Educational Director from 1948 to 1949 and Educational Director from 1949 to 1951. From 1951 to 1959 he was Field Representative for the eleven Western states, operating out of the San Francisco office of the Association. In these positions he consulted with state and local officials in the field of traffic safety.

Dr. Strasser serves as President of the California Driver Education Association and Chairman of the Driver Education Section of the National Safety Council. He is a fellow of the American Academy of Safety Education and a member of the American Driver and Traffic Safety Education Association. Dr. Strasser is presently principal investigator in a research study being conducted on traffic-violator driver improvement schools.

RICHARD TOSSELL

Dr. Tossell received his B.A. in psychology from the University of California at Los Angeles, his M.A. in safety education from New York University, and his Ed.D. in safety education from New York University. He is presently an Associate Professor of safety education and the Assistant Director of the Safety Education Center at Central Missouri State College where he is responsible for curriculum development.

He served as a Graduate Assistant with teaching responsibilities at the Center for Safety Education, New York University. He has been Assistant Director of the Esso Safety Foundation, Manager of Esso's Department of Highway Traffic, and Assistant Director of the New York State Citizen's Council on Traffic Safety. Other experience includes being Assistant Director of the President's Committee for Traffic Safety and Special Assistant to the Director of the Office of Safety Manpower, National Highway Safety Bureau, U.S. Department of Transportation. Dr. Tossell is presently on the Executive Committee, Higher Education Section, National Safety Council. During the two year period 1967-69, he is serving as Chairman of the Research Division, ADTSEA, NEA.

Dr. Tossell holds membership in the following professional associations: National Education Association, American Driver and Traffic Safety Education Association, American Society of Safety Engineers, Missouri State Teachers Association, Phi Delta Kappa, Missouri Driver and Traffic Safety Education Association, National Safety Council.

PATRICIA F. WALLER

Dr. Waller completed her A.B. in psychology and zoology and her M.S. in psychology at the University of Miami, Coral Gables, Florida, and her Ph.D. in psychology at the University of North Carolina. She spent 1958-1960 on a United States Public Health postdoctoral research fellowship at the R.B. Jackson Laboratory in Bar Harbor, Maine. From 1961 through 1962 she was a staff psychologist at the V.A. Hospital in Brockton, Massachusetts. Returning to Chapel Hill in the fall of 1962, she has taught at the University of North Carolina from 1962 to the present. In addition to lecturing in psychology, since 1967 she has been a staff associate with the University of North Carolina Highway Safety Research Center.

Some of her affiliations include the American Psychological Association, Division 3 (Experimental); Division 12 (Clinical); and Division 28 (Psychopharmacology). She is also a member of Eastern Psychological Association, Southeastern Psychological Association, North Carolina Psychological Association, (Secretary-Treasurer), Sigma Xi, American Association for the Advancement of Science, and Society for Projective Techniques. She is listed in American Men of Science and Leaders in American Science.

Dr. Waller has published in Journal of Projective Techniques, Journal of Consulting Psychology, Journal of the Experimental Analysis of Behavior, and Psychological Reports, as well as authored reports published by the University of North Carolina Highway Safety Research Center.

XII PARTICIPANTS AT BOTH SYMPOSIA

PARTICIPANTS AT THE NATIONAL DRIVER EDUCATION AND TRAINING SYMPOSIA

(D) . . Attended the December Symposium
(J) . . Attended the January Symposium
* . . Attended both Symposia

James Aaron (D)
Coodinator of Safety Center
Southern Illinois University
Carbondale, Illinois 62901

Leonard Albano (D)
Office of Supt.
Cook County Schools
Clark & Washington Streets
Chicago, Illinois 60602

George Albrecht (J)
North Shore Driving School
4935 W. Foster Avenue
Chicago, Illinois 60630

Marie Anderson (J)
Owner, Aurora Driving School
2348 Dayton Street
Aurora, Colorado 80010

Merrill Anderson (J)
Twin City Driving School
27 W. Lake St.
Minneapolis, Minn. 55408

William Anderson (D)
Teachers College,
Columbia University
New York, New York 10027

Harold Archibald (J)
Amer. Driver Educ. Institute
724 1/2 Echo Park Avenue
Los Angeles, Calif. 90026

Russell Arend (D)
Ass't. to Director, Traffic
Instit., Northwestern Univ.
1804 Hinman Ave.
Evanston, Illinois 60201

Samuel Atkins (J)
Owner, Atkins Driving Sch.
35 Thomas Road
Inverness, Florida 32650

Jack Baldwin (J)
Safe-Way Driving School
4610 W. Kennedy Blvd.
Tampa, Florida 33600

Gale Barkalow (J)
North Shore Driving School
4935 W. Foster Avenue
Chicago, Illinois 60630

Miles Barker *
President, Four Lakes
Driver Training School
3301 University Avenue
Madison, Wisconsin 53700

Michael Bass (J)
Safeway School of Driving
554-62 Gower Street
Los Angeles, Calif. 90028

Alfons Behnke (J)
Owner, Alpine Driving School
7109 W. Capitol Drive
Madison, Wisconsin 53216

James Berry (D)
Director, Transportation
Safety Program, Accident
Prevention Laboratory
University of Iowa
Oakdale, Iowa 52319

Julius Bero (J)
Garfield Heights Driv. Sch.
14103 Broadway
Cleveland, Ohio 44125

Tommy Bertone (D)
Consultant, Booz Allen
& Hamilton
1625 Eye Street
Washington, D.C. 20006

Richard Bishop (D)
Florida State University
Tallahassee, Florida 32306

Noel Blankenship (D)
Instructor, Driver Education
Kent State University
Kent, Ohio 44240

Benjamine Bogue (J)
Nat'l. School of Safe Driving
3002 N. Laramie Avenue
Chicago, Ill. 60641

Edward Bonessi (D)
Chm., Traf. Saf. Ed. Dept.
So. Conn. State College
New Haven, Conn. 06515

Charles Boright (D)
Consult., Dept. of Educ.
Montpelier, Vermont 05602

Clifford Boyce (D)
Dir. of Safety Education
State Dept. of Education
Olympia, Washington 98501

Richard Boyer (D)
Super., Driver Education
Allstate Plaza
Northbrook, Ill. 60062

Don Bray (D)
Coordinator, Driver Education
Royal Oaks Public Schools
1500 Lexington Ave.
Royal Oaks, Michigan 48067

Lamar Breland (J)
Driving School Owner
946 Parlange Dr.
Baton Rouge, Louisiana 70800

Robert Brenner *
Deputy Director, National
Highway Safety Bureau
U.S. Dept. of Trans.
Washington, D.C. 20591

Gilbert Brewer (D)
Pres., Ideal Driving School
533 Des Peres Avenue
St. Louis, Mo. 63112

Gene Bristol (D)
Sec. Ed., Minnetonka Schools
Minnetonka, Minn. 55331

Leon Brody *
Director of Research
Cntr. for Saf., New York Univ.
Washington Square
New York, New York 10003

G.B. Brown (D)
Chairman, Driver Education
Jefferson High School
Cedar Rapids, Iowa 52404

Harry Brown (D)
Super., Saf. Ed., Bd. of Educ.
226 N. 1st Ave., East
Duluth, Minn. 55802

Russell Brown (D)
Safety Management Institute
1900 "L" St., N.W.
Washington, D.C. 20006

Donald Bruggeman (J)
Owner, A-A-Auto Driving School
3458 Mayfield Rd.
Cleveland Hts., Ohio 44118

Charles Buffone (J)
Field Super., Hwy. Saf. Prog.
14 Beacon St., Rm. 105
Boston, Mass. 02108

Eugene Burd (D)
Dir. of School Traffic Safety
Rm. 225, State House
Indianapolis, Ind. 46204

Ray Burneson (D)
Sect'y., Traf. Educ. Train.
Comm., Nat'l. Safety Council
425 N. Michigan Ave.
Chicago, Ill. 60611

Dale Bussis (D)
Sect'y., Instit.for Ed. Devel.
52 Vanderbilt Ave.
New York, N.Y. 10017

Allan Cafferty (D)
Consult., St. Dept of Educ.
Statehouse
Boise, Idaho 83707

Leonard Cain (D)
Supervisor, Safety Education
P.O. Box 771
Jackson, Mississippi 39200

Thomas Campagna (J)
Atkins Driving School
1 Farmingdale Rd.
West Babylon, N.Y. 11702

Joseph Casey (D)
Dir. Dri. & Traf. Saf. Educ.
Lakewood High School
Lakewood, Ohio 44107

Robert Chapman *
Director of Studies
Institute for Educ. Devel.
17651 Iron Bark Way
Irvine, Calif. 92664

Thomas Cheney (J)
Owner, Cheney Bros. Dri. Sch.
6021 York Blvd.
Los Angeles, Calif. 90042

Louis Chickos (D)
Supervisor, Driver Education
822 City Hall
Buffalo, N.Y. 14202

Maren Christensen *
Study Assistant
Institute for Educ. Devel.
999 N. Sepulveda Blvd.
El Segundo, Calif. 90245

Thomas Comer (J)
Driving School Owner
717 Main Street
Waltham, Massachusetts 02000

John Conger *
V.Pres. for Medical Affairs
Univ. of Colorado
4200 E. 9th Avenue
Denver, Colo. 80220

Dean Cook (D)
Admin., Aetna Life & Caslty.
151 Farmington Ave.
Hartford, Conn. 06115

Harvin Cook (J)
St. Super. of Pub. Inst. Off.
325 S. 5th St.
Springfield, Illinois 62700

William Covert (J)
Michigan State University
527 D. Spartan Village
E. Lansing, Mich. 48823

J.B. Angelo Crowe (D)
Consult., St. Dept. of Educ.
State Office Bldg.
Atlanta, Georgia 30300

Edwin Darland (D)
Asst. Pro., San Jose St. Coll.
125 S. 7th Street
San Jose, Calif. 95114

Moe Dollinger (J)
Owner, Academy Driving Sch.
7117 Pacific Blvd.
Huntington Park, Calif. 90255

Richard Dootson (J)
Owner, A&A Dootson Dri. Sch.
9417 Las Tunas
Temple City, Calif. 91780

Gerald Driessen (D)
National Safety Council
425 N. Michigan Ave.
Chicago, Ill. 60611

L.L. Dunlap (D)
St. Dept. of Education
Columbia, S.C. 29201

LeRoy Dunn *
Acting Chief, Dri. Ed.
Training Division
National Highway Safety Bur.
Washington, D.C. 20591

Francis Dunnigan (J)
Dir., Office of Driver Train.
State Highway Bldg., Rm.116
St. Paul, Minn. 55101

John Eales (D)
Consult., St. Dept. of Educ.
721 Capitol Mall
Sacramento, Calif. 95814

Francis Eckerman (D)
Dir. of Safety
A A A--Wisc. Division
433 W. Washington Ave.
Madison, Wis. 53701

Roy Edgerton (J)
Asst. Dir., Hwy.Research Bd.
2101 Constitution Ave.
Washington, D.C. 20418

Dorothy Edwards (D)
Assoc. Dir., Acc.Res. Cntr.
Amer. Instit. for Research
8555 16th St.
Silver Springs, Md. 20910

Ivan Eland (D)
Northern Iowa Univer.
1428 Maplewwod Drive
Cedar Falls, Iowa 50613

Fred Ellis (J)
Ontario Safety League
208 King St., West
Toronto 1, Ontario Canada

Richard Ellis (D)
Dir., Traff. Saf. Ed. Prog.
State Univ. at Albany
Albany, N.Y. 12203

Joe Farmer (D)
Dir., Driver Training
P.O. Box 1300
Richardson, Texas 75080

Robert T. Filep *
Director of Studies
Institute for Ed. Develop.
999 N. Sepulveda Blvd.
El Segundo, Calif. 90245

Alfred Finch (J)
Mgr., Motor Trans. Dept.
National Safety Council
425 N. Michigan Ave.
Chicago, Ill. 60611

L.R. Fink (D)
Insur. Instit. for Hwy. Saf.
2600 Virginia Ave.
Washington, D.C. 20037

Thomas Fitzgerald (J)
Owner, Fitzgerald's Dri. Sch.
1350 Deer Park Ave.
N. Babylon, N.Y. 11703

A.E. Florio (D)
Prog. Dir. for Saf.&Dri. Ed.
University of Illinois
212 A Geo. Huff Gym
Champaign, Ill. 61820

T.W. Forbes (D)
Professor of Psychology
Michigan State University
E. Lansing, Michigan 48823

Charles Foreman (J)
Owner, Foreman's Driv. Sch.
3206 West Vernon Ave.
Los Angeles, Calif. 90008

Ray Frick (J)
Frick's Driver Educ. School
347 Lincoln Way West
South Bend, Indiana 46600

Robert Gagné *
Professor of Educ. and Psych.
University of California
Berkeley, California 94700

Shelby Gallien (D)
Professor, Dri. & Saf. Educ.
University of Wisc.
Milwaukee, Wisc. 53201

U. Hale Gammill (J)
Owner, International Sch.Driv.
3502 Geary Blvd.
San Francisco, Calif 94100

David Gantner (J)
Pres., North Star Dri. Sch.
291 Snelling Ave.
St. Paul, Minn. 55104

Mel Gard (J)
North Shore Driving School
4935 W. Foster Ave.
Chicago, Ill. 60630

Jess Gardner (D)
Assoc. Prof. Coll. of Ed.
University of Kentucky
Lexington, Kentucky 40506

Clarence Gawer (D)
Driver Education Instructor
Owensville High School
Owensville, Missouri 65066

Cissie Gieda (D)
Safety Coor. Montgomery Co.
Pindell School Road
Fulton, Maryland 20759

Robert Goff (D)
Univ. of Utah
1899 Sycamore Lane
Salt Lake City, Utah 84117

Phil Gram (D)
Traf. Saf. & Hwy. Impro. Dept.
Ford Motor Co.
The American Road
Dearborn, Michigan 48121

Walter Gray (D)
Assoc. Prof. of Health & Saf.
Indiana St. Univ.
Terre Haute, Indiana 47809

Kenneth Gromacki (J)
A-Arcade Drivers Sch., Inc.
759 N. Plankington Ave.
Milwaukee, Wisconsin 53203

George Gruner (J)
Asst. Mgr., Fleet Operations
American Motors
14250 Plymouth Rd.
Detroit, Michigan 48232

James Gumm (D)
Dir. of Safety, State Dept.
of Education
132 Cordell Hull Bldg.
Nashville, Tenn. 37219

Robert Gustafson (D)
Asst. Prof., Mich. St. Univ.
Rm. 70, Kellogg Center
E. Lansing, Mich. 48823

Clifford Hahn (D)
Dir. Accident Research Cntr.
Amer. Instit. for Research
8555 16th Street
Silver Springs, Md. 20910

Paul Halula (J)
Amer. Univ. Driver Train. Sch.
2296 Geary Blvd.
San Francisco, Calif 94100

Harry Harman *
Dir., Off. of Comput. Sciences
Educational Testing Service
Princeton, New Jersey 08504

John Hartman (D)
Board of Public Education
341 S. Bellefield Ave.
Pittsburgh, Pa. 15213

Wesley Hartzell (D)
Pres., Bd. of Ed., Dis.207
Cook County 445 N. Michigan
Chicago, Illinois 60611

John Hassett (J)
Wash. Rep., NPDEA
1629 "K" St., N.W. Rm.534-A
Washington, D.C. 20006

Earl Heath *
Contract Manager,
National Highway Safety Bur.
Washington, D.C. 20591

George Hensel (J)
Pres., A-Calif. Driv. Sch.Inc.
111 W. Pomona Blvd.
Monterey Park, Calif. 91754

Paul Hill (J)
Asst. General Manager
National Safety Council
425 N. Michigan Ave.
Chicago, Illinois 60611

Arthur Hillenburg (J)
North Shore Driving School
4935 W. Foster Ave.
Chicago, Illinois 60630

Barbara Hodge (J)
Harold Hodge (J)
A-Safeway Driving School
860 University Ave.
St. Paul, Minn. 55104

Harold Holmes (D)
Director, Driver Education
National Safety Council
425 N. Mighigan Ave.
Chicago, Illinois 60611

Edward Holsinger (J)
Dir. of Driving Schools
5353 Claremont Ave.
Oakland, California 94600

Gordon Hough (D)
Institute for Educ. Develop.
80 Christie Hill Rd.
Darien, Conn. 06820

Emanuel Hreha (J)
Pennsylvania Driving Sch.
348 E. 27th St.
Erie, Pennsylvania 16500

Louis Hull (J)
Garber's Auto Driving School
1406 Beacon St.
Brookline, Massachusetts 02000

Marshall Hungness, Jr. (J)
MSH Driving School
3413 Auburn St.
Rockford, Illinois 61100

C.W. Imhoff (D)
Dir., Driver Improve. Prog.
National Safety Council
425 N. Michigan Ave.
Chicago, Illinois 60611

Paul Irick (D)
Highway Research Board
2101 Constitution Ave.
Washington, D.C. 20006

Ralph Jackson *
Allstate Insurance Co.
Allstate Plaza
Northbrook, Ill. 60062

Don Janowski (J)
North Shore Driving School
4935 W. Foster Ave.
Chicago, Illinois 60630

John Janzaruk (J)
Janzaruk School of Driv. Ed.
1901 Frances Ave.
Elkhart, Indiana 46514

Curtis Job (J)
ABC Driving School, President
1607 East Lake Street
Minneapolis, Minnesota 55400

Billy Johnson (D)
Super, Dri. Educ. St. Bd. of Ed.
1322 E. Grace St.
Richmond, Virginia 23216

Duane Johnson (D)
Assoc, Prof., Saf. & Traf. Saf.
No. Illinois University
DeKalb, Illinois 60115

Delbert Karnes (D)
Grad. Asst., S.W. Cntr. for Saf.
Oklahoma St. Univ.
Stillwater, Oklahoma 74074

Francis Kenel (D)
Chm., Traffic & Safety Ed.
Illinois St. Univ.
Normal, Illinois 61761

John Kennedy *
Vice-President
Institute for Educ. Develop.
52 Vanderbilt Ave.
New York, N.Y. 10017

John Kerrick (J)
Dir., Drivers Services Div.
Amer. Assoc. Motor Veh. Admin.
404 Madison Blvd.
Washington, D.C. 20001

Norman Key (D)
Exec. Secretary,
National Educ. Assoc.
1201 16th St., N.W.
Washington, D.C. 20036

Harvey King (J)
Secondary Consultant
Pouch F
Juneau, Alaska 99801

John Kinzer (D)
Nat'l. Highway Safety Bur.
6820 La Tijera Blvd.
Los Angeles, Calif. 90045

Edward Klamm *
Accident Prevention Mgr.
Allstate Insurance Co.
Northbrook Plaza
Northbrook, Ill. 60062

Philip Klein (J)
U.S. Auto Club, Pres.
404 Jay St.
Brooklyn, New York 11200

Michael Koch (J)
3229 W. Montrose
Chicago, Illinois 60618

William LaPietra (J)
Universal Driving School
5421 N. Harlem Ave.
Chicago, Illinois 60656

M. Larson (D)
Amer. Society of Saf. Eng.
Park Ridge, Illinois 60068

Carl Laybourn (J)
Dir. of Safety Education
Dept. of Transportation
Queens Park
Toronto 5, Ontario, Canada

Ruth Link (J)
Safeway Driving School
7454 N. Harlem Ave.
Chicago, Illinois 60648

Evaret Lesser (J)
Univ. Driving School, Inc.
5241 N. Harlem Ave.
Chicago, Illinois 69656

Joseph Luty (J)
Amer. Easy-Way Driv.Sch.Inc.
471 Maple Ave.
Hartford, Conn. 06114

William Lybrand *
Dir.& Prin. Invest., DETRI
The American University
5185 MacArthur Blvd., N.W.
Washington, D.C. 20016

Gary McAvoy (D)
Super., Dri.&Traf. Educ.
Evanston Township H.S.
1600 Dodge Ave.,
Evanston, Ill. 60204

William McCluskey *
Owner, A-Arcade Dri. Sch., Inc.
759 N. Plankington Ave.
Milwaukee, Wis. 53203

John McGinley (J)
Owner, AA Indiana Driv. Sch.
420 Emerson Ave.
Indianapolis, Ind. 46219

Frederick McGuire (D)
Univer. of Calif., Irvine
Irvine, Calif. 92664

James McLarry (D)
Dri. Ed. Specialist
State Dept. of Education
Santa Fe, New Mexico 87501

Gene MacDowell (D)
Exec. Sect'y., Dri. and
Safety Educators Assoc.,N.Y.
142 Middle Road
Horseheads, N.Y. 14845

Raymond Magwire (D)
Coord. Health,Saf. & Phys.Ed.
Dept. of Education
Montpelier, Vt. 05602

Alvin Malone (D)
Super., Adult Driv. Ed.
Jackson, Mississippi 39200

Sidney Marland (D)
Pres., Inst. for Ed. Develop.
52 Vanderbilt Ave.
New York, New York 10017

Robert Marshall (D)
Dir., Safety Educ. Center
Central Mo. St. College
Warrensburg, Mo. 64093

Dewayne Marshman (J)
Minnesota Driving Sch., Inc.
520 Lowry Ave., N.E.
Minneapolis, Minn. 55418

Ray Martinez (D)
Asst. Dir., Driver Improve.
National Safety Council
425 N. Michigan Ave.
Chicago, Illinois 60611

George Mathis *
Dir. of Safety Educ.,
Office of Public Instr.
325 S. 5th Street
Springfield, Ill. 62700

Howard Matthias (J)
Highway Traffic Saf. Cntr.
Michigan State Univ.
E. Lansing, Michigan 48823

Linda Memmler (J)
Universal Driving School
5241 N. Harlem Ave.
Chicago, Illinois 69656

Jack Millard (J)
Pres., United Truck Dri.Sch.
12551 E. Telegraph Rd.
Santa Fe Springs, Calif. 90670

Larry Milligan (J)
A.Arcade Drivers Sch., Inc.
759 N. Plankington
Milwaukee, Wisconsin 53200

Peter Monday (J)
Pres., A-1 Drivers Sch.,Inc.
3431 W. Villard Ave.
Milwaukee, Wis. 53209

Hemby Morgan (D)
Super., Safety Educ.
La. Dept. of Educ.
Capitol Building
Baton Rouge, La. 70804

Robert Murphy (J)
North Shore Driv. School
4935 W. Foster Ave.
Chicago, Illinois 60630

Heinz Naumann (J)
Reg. Dir., Canada, NPDEA
253 Bloor St. East
Toronto 5, Ontario, Canada

John Noe (D)
Super., St. Dept. Pub. Instr.
Raleigh, North Carolina 27600

Robert Nolan (D)
Assoc. Prof.,Hwy. Saf. Cntr.
Michigan State University
E. Lansing, Michigan 48823

John Noonan (D)
Sales Promotion Manager
General Motors Corporation
Detroit, Michigan 48200

Ted Oakland (J)
Owner, ABC Driving School
6 E. Exchange St.
Akron, Ohio 44300

Charles O'Day (J)
Owner, O'Day's Sch.of Driv.
3494 Sheridan Dr.
Eggertsville, N.Y. 14226

Philip O'Leary (D)
Consult., Dept. of Educ.
P.O. Box 420
Lansing, Mich. 48902

Arthur Opfer (D)
Automotive Safety Found.
200 Ring Bldg.
Washington, D.C. 20006

B.E. Parker (D)
University Safety Center
Baylor University
Waco, Texas 76703

Donald Parker (J)
Janice Parker
Pres.,Interstate Pro. Dri.Sch.
Pittsburgh, Pa. 15216

C.A. Perkins (J)
A-1 Peck Driving School,Owner
1419 Sylvania Ave.
Toledo, Ohio 43613

Fletcher Platt (J)
Mgr. Traf. Saf.&Hwy.Impro.Dpt.
Ford Motor Company
The American Road
Dearborn, Mich. 48121

Richard Plum (D)
Ed. Con.,Amer. Auto.Assoc.
1712 G St. N.W.
Washington, D.C. 20006

Warren Quensel (D)
Asst. Prof. Traf. & Saf. Ed.
Illinois St. University
Normal, Illinois 61761

Thad Rarogiewicz *
A-Easy Method Nat.Dri.Sch,Own.
408 McKinley Ave., N.W.
Canton, Ohio 44702

Neal Rathjen (D)
Consult., Kenosha Schools
6347 46th Ave.
Kenosha, Wisconsin 53140

Leonard Raymond (J)
Mobil Research & Devel. Corp.
150 E. 42nd St.
New York, New York 10017

John Reedy, Jr. (J)
Lord Ashley Driver School
3422 Rivers Ave.
Charleston, S.C. 29405

Raymond Regan (J)
Universal Driv. Schools, Inc.
5241 N. Harlem Ave.
Chicago, Illinois 60656

Joyce Reid (J)
North Shore Driving School
4935 W. Foster Ave.
Chicago, Illinois 60630

William Rhodes (J)
Univ. of Houston
Cullen Blvd.
Houston, Texas 77000

William Richards (D)
Director of Driver Education
Dept. of Public Instruction
126 Langdon St.
Madison, Wisconsin 53700

Michael Right (J)
3917 Lindell
St. Louis, Mo. 63108

Dale Ritzel (D)
Instr., Safety Center
Southern Illinois Univ.
Carbondale, Ill. 62901

Warren Rumsfield *
Owner, No. Shore Dri. School
4935 W. Foster Ave.
Chicago, Illinois 60630

Ann Russo (J)
Thomas Russo
Mich. Assn. of Pro.Dri. Sch.
20243 Keating
Detroit, Michigan 48203

Mercie Salgados (J)
Penn. Driving School
348 E. 27th St.
Erie, Pennsylvania 16500

Angelo Scalet (D)
Ohio Driv&Saf. Ed. Assn.
129 N. Grant
Wooster, Ohio 44691

William Schmitz(D)
Nat'l. Hwy. Users Conf.
30 N. La Salle St.
Chicago, Illinois 60602

Rose Schrock (J)
Owner, Schrock Driv. Sch.
574 Courtland Ave.
Lima, Ohio 45801

Jay Scott (D)
St. Dept. of Public Inst.
120 E. 10th St.
Topeka, Kansas 66612

Paul Selby (D)
Consult., N.J. Dept. of Ed.
225 W. State St.
Trenton, New Jersey 08600

William Sell (D)
Supervisor, Driver Educ.
Ohio Dept. of Ed.
65 Front St.
Columbus, Ohio 43215

James Shea (D)
Asst. Prof.,St. Univ. College
at Buffalo
Williamsville, N.Y. 14221

Leslie Silvernale (D)
Michigan State Univ.
Kellogg Center
E. Lansing, Mich. 48823

Harold Smith (J)
Harold Smith Dri. Impr. Inst.
1460 Rosecrans Dr.
San Diego, Calif. 92106

Lawton Smith *
Office of Civic Affairs
Chrysler Corp.
Detroit, Mich. 48231

Ray Smith (D)
Moline Public Schools
1411 28th Ave.
Moline, Illinois 61265

James Standifer (D)
Prof.,Texas Christian Univ.
Dept. of H.P.E
Fort Worth, Texas 76129

Reinhard Stern (J)
Opr., Stern-Fybel Dri. Sch.
8558 W. 3rd St.
Los Angeles, Calif. 90048

George Stewart (D)
Dep. Dir., Program Liaison
Ex. Office of Hwy.Saf. Plan.
Lewis Cass Bldg.
Lansing, Mich. 48913

Marland Strasser (J)
San Jose St. College, Prof.
1600 English Dr.
San Jose, Calif. 95129

Harold Sullivan (D)
American Bar Association
8333 Lincoln Ave.
Skokie, Illinois 60076

Robert Sundermeier (D)
Consul., Colo. Dept. of Ed.
201 E. Colfax Ave.
Denver, Colo. 80203

Francis Svarc (D)
Super, Saf. Ed., Chic. Bd. Ed.
228 N. La Salle St.
Chicago, Illinois 60601

William Tarrants *
Acting Dir., Off. of Saf.
Manpower Development
National Highway Safety Bur.
Washington, D.C. 20591

Gilbert Teal *
Dir., Cntr. for Acc. Prev.
Dunlap & Assoc.
One Parkland Drive
Darien, Conn. 06820

Richard Thorstens (J)
Owner, A-1 Driving School
2579 Metairie Rd.
Metairie, Louisiana 70001

Travice Tice (D)
St. Dept. of Educ.
Oklahoma City, Oklahoma 73100

H.H. Tielke (D)
Heights Driving Sch., Inc.
26 Front Street
Berea, Ohio 44017

William Timberlake (D)
The Traffic Institute
1804 Hinman Ave.
Evanston, Illinois 60201

Raymond Timney (J)
V.P., Dri. Trainer Pro.Ltd., Inc.
2399 Summer Street
Stamford, Connecticut 06901

William Todd (D)
Super., Memphis City Schools
2597 Avery Ave.
Memphis, Tenn. 38112

Richard Tossell (D)
Asst. Dir. Saf. Educ. Cntr.
Central Missouri St. Coll.
Warrensburg, Mo. 64093

Stephen Toth (J)
Regulation Driving School
597 Sport Hill Rd.
Easton, Connecticut 06425

M.D. Tracy (J)
Harold Smith Dri. Impro. Inst.
333 N. Michigan Ave.
Chicago, Illinois 60611

Robert Ulrich (D)
Asst. Prof., Saf. Educ. Cntr.
Central Missouri St. Coll.
Warrensburg, Mo. 64093

H.B. Vinson (J)
Owner, Texas Driving School
1625 N. Industrial Blvd.
Dallas, Texas 75207

Fred Wahl (J)
Owner, Tri-Valley Driv. Sch.
9763 Mason Ave.
Chatsworth, Calif. 91311

Patricia Waller (D)
Res. Assoc., Hwy. Saf.Res.Ctr.
Univ. of N.C., VETS Club
Chapel Hill, N.C. 27514

Joseph Welch (J)
Pres., Michael's Dri. Schl.
106 E. Lake St.
Addison, Illinois 60611

Richard Whitworth *
Asst. Dir. of Driv. Educ.
National Safety Council
425 N. Michigan Ave.
Chicago, Illinois 60611

Peter Wilk (J)
Owner, Academy of Dri. Train.
15032 Grand River
Detroit, Mich. 48227

E.R. Williamson (D)
Dri. Ed. Super.
Northern State College
Aberdeen, S.D. 57401

Dean Wilson (D)
Coord., Dri. & Traffic Educ.
Pontiac Public Schools
1051 Arlene Street
Pontiac, Mich. 48055

James Wilson (J)
A-1 Auto Driving Sch., Inc.
5221 N. Elston
Chicago, Illinois 60630

Albert Wollenberg (J)
Wollenberg Driv. School
247 Park Ave.
Bristol, Conn. 06010

W.H. Wood, Col., USAF (D)
Directorate of Aerospace Saf.
Norton Air Force Base
California 92409

John Woods (J)
Wood's So. Shore Dri.Sch,Own.
357 Washington Street
Braintree, Mass. 02184

William Woods (J)
Woods So. Shore Dri. Sch.,Own.
357 Washington St.
Braintree, Mass. 02184

John Wynia (J)
A C M E Driving School
650 King Star East
Kitchener, Ontario, Canada

Sam Yaksich *
Asst. Dir. Traf. Eng.&Saf. Dept.
Amer. Auto Assoc.
1712 G. Street, N.W.
Washington, D.C. 20006

William Yarish (J)
Driver Trainer Prof.Ltd, Inc.
2399 Summer Street
Stamford, Connecticut 06901

John Young (J)
A-Arcade Drivers Sch., Inc.
759 N. Plankington
Milwaukee, Wis. 53202

Cecil Zaun (D)
Los Angeles City Schools
1200 N. Cornwell St.
Los Angeles, Calif. 90033

XIII APPENDIX

INVITATION LETTERS

EVALUATION FORM

SYMPOSIA STAFF

IED
INSTITUTE FOR EDUCATIONAL DEVELOPMENT
999 N. SEPULVEDA BLVD. · EL SEGUNDO, CALIFORNIA 90245 · (213) 772-2127

October 17, 1968

Dr. Eugene Conahan
7259 E. Laketree Street
Madison, Wisconsin 53700

Dear Dr. Conahan:

Many individuals and organizations are actively concerned with effective driver education and training and you must certainly be included in this group. In order to provide a forum where you can receive information on selected new programs in driver education and also share your experiences with others, you are cordially invited to attend a national driver education and training symposium from December 1st through the 4th, 1968.

The symposium will be conducted by the Institute for Educational Development under the sponsorship of the National Highway Safety Bureau for the purpose of reporting the progress of selected research and evaluation programs in driver education, and, utilizing the experience and cooperation of representative educators, contributing to the effective implementation of recent research findings in this field.

The scope of the symposium will include presentation of the "state-of-the-art" in driver education and related fields; the communication of plans, policies, and programs of the National Highway Safety Bureau to members of the driver education community; and an exchange of information between the Bureau and the professionals associated with driver education programs in public and private schools.

This meeting is being designed to provide maximum opportunity for individual participation and "two-way communication" by all who attend. Seminar settings, discussion groups, and questions from participants will be "in". Your ideas and opinions will be actively solicited by the seminar leaders and you will be asked to discuss the real world issues in this field.

The symposium will be held at the Drake-Oakbrook Motel located in a lovely countryside setting only fifteen minutes from Chicago's O'Hare International Airport. Since the number of participants in such a symposium must, by its very nature, be limited, I would encourage you to let us know as soon as possible if you plan to attend. A preliminary program and a return postcard for your reply are enclosed.

We look forward to your participation.

Sincerely,

John L. Kennedy

John L. Kennedy
Vice-President

JLK:pl
Enclosures

INSTITUTE FOR EDUCATIONAL DEVELOPMENT
999 N. SEPULVEDA BLVD. · EL SEGUNDO, CALIFORNIA 90245 · (213) 772-2127

November 22, 1968

Mr. Ralph Jackson
225 E. 46th Street
New York, New York 10017

Dear Mr. Jackson:

You must certainly be included in the group of individuals who are actively concerned with effective driver education and training. In order to provide a forum where you can receive information on selected new programs in driver education and also share your experiences with others, you are cordially invited to attend a national driver education and training symposium from January 26th through 29th, 1969.

The symposium will be conducted by the Institute for Educational Development under the sponsorship of the National Highway Safety Bureau. The purpose -- to report the progress of selected research and evaluation programs in driver education, and, to utilize the experience and cooperation of commercial school operators and educators, thus contributing to the effective use of recent research findings and practices.

The scope of the symposium will include presentation of the "state-of-the-art" in driver education and related fields; the communication of plans, policies, and programs of the National Highway Safety Bureau to members of the driver education community; and an exchange of information between the Bureau and the professionals associated with driver education programs in commercial driving schools.

This meeting is being designed to provide maximum opportunity for individual participation and "two-way communication" by all who attend. Seminar settings, discussion groups, and questions from participants will be "in". Your ideas and opinions will be actively solicited by the seminar leaders and you will be asked to discuss the real world issues in this field. Alternative solutions to major problems in this field will be explored.

The symposium will be held at the Drake-Oakbrook Motel located in a lovely countryside setting only fifteen minutes from Chicago's O'Hare International Airport. Since the number of participants in such [illegible] symposium must, by its very nature, be limited, I would encourage you to let us know as soon as possible if you plan to attend. A preliminary program and a return postcard for your reply are enclosed.

We look forward to your participation.

Sincerely,

John L. Kennedy

John L. Kennedy
Vice-President

JLK:pl
Enclosures

NATIONAL DRIVER TRAINING AND EDUCATION SYMPOSIUM
EVALUATION QUESTIONNAIRE

1. What did you expect to gain from attendance at this Symposium?

2. Were your objectives achieved?

____Well Achieved ____Moderately Achieved ____Not Achieved

3. Please rate the value to you of the various parts of the Symposium:

	Much	Some	Little	None
Luncheon and Dinner Speeches:	____	____	____	____
Morning Presentations:	____	____	____	____
Discussion period after Speeches:	____	____	____	____
Seminars:	____	____	____	____
Informal Discussion Groups:	____	____	____	____
Preconference Materials:	____	____	____	____

4. The speeches, presentations, or seminar sessions MOST INTERESTING OR USEFUL for my purposes were:

5. The speeches, presentations, or seminar sessions LEAST INTERESTING OR USEFUL for my purposes were:

6. What did you like most about the organization and procedure of the Symposium?

7. A suggested change or improvement in organization or procedure would be:

8. What new topics might well be added to a future similar Symposium?

9. Who was the leader of your seminar group?____________________
Please rate this seminar according to the following scale:
A(extremely valuable): B(moderately valuable): C(of little value):

10. For future symposia, do you think: A(more): B(less): C(same amount) of time should be spent in seminar groups? :

11. A suggested change or improvement in the organization or procedure of the seminars would be:

12. In general, how would you rate this Symposium?

____Excellent ____Good ____Fair ____Poor

(PLEASE USE THE BACK OF THE PAGE FOR FURTHER SUGGESTIONS OR COMMENTS)

SYMPOSIA STAFF

PRINCIPAL

John L. Kennedy

CO-PRINCIPAL

Robert T. Filep

PROJECT ASSISTANT

Mrs. Maren Christensen Dalrymple

COPY EDITOR

Mrs. Miriam H. Godshalk

SECRETARY

Mrs. Su Conahan

to close the circle...
to link education,
industry and government

IED

INSTITUTE FOR EDUCATIONAL DEVELOPMENT
[illegible] Vanderbilt Avenue, New York, N. Y. 10017, (212) [illegible]
[illegible] North Sepulveda Boulevard, El Segundo, Calif. [illegible], (213) [illegible]